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PROCEEDINGS

OF THE

SCIENTIFIC MEETINGS

OF THE

ZOOLOGICAL SOCIETY OF LONDON.

January 6, 1874.

Dr. A. Günther, F.R.S., V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of December 1873:—

The total number of registered additions to the Society's Menagerie during the month of December was 54, of which 4 were by birth, 27 by presentation, 10 by purchase, 4 received in exchange, and 9 received on deposit. The total number of departures during the same period by death and removals was 108.

Amongst the additions two only are of sufficient interest to call for special remarks. These are:—

1. A female Onager, or Wild Ass of Cutch (*Equus onager*), presented December 23rd by Captain Henry Lowther Nutt, Acting Assistant Political Agent in Kattagwar. The following extract from a letter of Captain Nutt relates to this animal:—

"I think I told you that I ran it down on the Runn of Kutch. I was riding hard after it for 3 hours and 5 minutes; and the estimated length of the chase was 40 miles. I rode two horses, as I discovered from the 'puggies,' or watchers near the Runn, that if the animals were disturbed from where they were they would probably make for another place some 12 or 13 miles distant. I was therefore able to post a fresh party of horsemen and a fresh horse for myself at the place further on; and true enough the herd did make for the spot indicated, so that the running was taken up and continued with the fresh horses; and in this way the capture was effected, but even then not until both my horses, which were in good order at the time, had been ridden to a standstill. This will give you an idea of the speed and endurance of these animals.

"I wrote an account of the chase; and it appeared in the June number, I think, of the 'Oriental Sporting Magazine,' under the head of 'Donkey-Hunting on the Runn of Kutch.'"

2. A pair of the new Japanese Stork lately described by Mr. Swinhoe in the Society's 'Proceedings' as *Ciconia boyciana*[*], brought home by Mr. Swinhoe, and presented to the Society by Mr. R. H. Boyce, Chief of H.M. Office of Works at Shanghai.

This fine new Stork is readily distinguishable from its two allies, *C. alba* and *C. maguari* (with which it has been placed in company at the Gardens) by its larger size, and the naked red line which runs through the eye. The bill is black, as in *C. maguari*, the legs red.

The sketch exhibited (Plate I.) from Mr. Keulemans's pencil will give a good idea of this most interesting new bird.

Dr. A. Leith Adams, F.Z.S., exhibited the horns, and made remarks on the appearance and habits, of a breed of the Common Goat which had returned to wildness on the cliffs of the Old Head of Kinsale, Ireland. The points remarked on were:—(*a*) the striking similitude of the horns to *Capra ægagrus* in comparison with the usual twisted contour of domesticated varieties; (*b*) the pronounced similitude in habits to feral species; (*c*) unusual length of the horn.

Mr. A. H. Garrod, in drawing attention to the death on December 14th of the female *Rhinoceros unicornis*, which had lived in the Society's Gardens for more than twenty-three years, remarked that the only pathological sign detected was the enlargement of the lymphatic glands at the base of the heart. Mr. Garrod's observations on the visceral anatomy of this Rhinoceros were quite confirmatory of those of Professor Owen. In addition he mentioned that there was a minute *os cordis* at the attached margin of one of the aortic valves, and that in the Perissodactyla this bone is not always absent, as by some supposed, he having found a large one in a Sumatran Tapir. The remarkable difference between the arrangement of the mucous membrane of the small intestine in the Indian and Sumatran Rhinocerotes (that of the former being produced into villi nearly an inch long through its whole length, whilst in the latter these were represented by valvulæ conniventes) was also illustrated from specimens in spirit.

The following papers were read:—

1. On the Species of the Genus *Synallaxis* of the Family *Dendrocolaptidæ*. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received January 6, 1874.]

(Plates II., III., & IV.)

Having some apparently new *Synallaxes* in my collection to describe, I found it necessary to make a thorough re-examination of the numerous species of this extensive genus, to which I had on several former occasions devoted some attention*. The result has been to establish to my greater or less satisfaction the validity of some fifty-eight species of the genus, of which I have examined specimens; while there remain a few others with which I think nothing can be done without reference to the original types, if they are still in existence.

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[*] See P. Z. S. 1873, p. 513.

The principal collections examined for the purpose of this synopsis are:—

1. My own, which contains 121 specimens referable to forty-nine species, those deficient being the nine marked with an asterisk in the table at the end of this paper.

2. That of Messrs. Salvin and Godman, containing fifty-seven specimens, amongst which is one of *S. rufigenis*, not in my own collection.

3. That of Mr. G. N. Lawrence of New York, which that gentleman, with his accustomed liberality, sent over to me for examination.

4. A selection of specimens from the Bremen Museum, intrusted to my care by Dr. Finsch.

5. A set of types from the Imperial Cabinet of Vienna, which the Directors of that liberal Institution have transmitted for examination, and which have been of the utmost importance, as being almost all unique specimens.

These five series I have had before me constantly whilst preparing this synopsis. But I have likewise examined:—

6. The specimens in the British Museum, amongst which are the types of *S. stictothorax*, *S. semicinerea*, and *S. scutata*.

7. The specimens in the Berlin Museum, amongst which are several important types of Lichtenstein and Cabanis.

8. The mounted and unmounted specimens in the Jardin des Plantes. The latter M. Milne-Edwards most courteously allowed me to bring over to London for comparison with my own skins. This has been of the utmost service to me (although the greater part of the synopsis was finished last summer, before I had seen them), as the series contained many original specimens of D'Orbigny, Castelnau and Deville, and other well-known collectors.

Before commencing my synopsis of the species of *Synallaxis* I propose to give a short chronological history of the genus, as follows:—

(1819.) The genus *Synallaxis* is established by Vieillot (N. Dict. d'H. N. xxxii. p. 309). The types given are *S. ruficauda* and *S. ruficapilla*.

(1820.) Temminck, in his 'Manuel d'Ornithologie' (preface, p. lxxii), establishes the genus *Anabates* with the "Rouge-queue de la Guiane" of Buffon for type, which = *Synallaxis guianensis*.

(1824.) Spix (Aves Brasil. i. p. 85) uses the genus *Synallaxis* for *S. ruficauda*, and makes another genus, *Parulus*, for his *P. ruficeps*, which = *Synallaxis spixi*.

(1825.) Vieillot (Gal. d. Ois. i. pl. 174) figures his *S. ruficapilla* as representing the genus *Synallaxis*, and his *S. ruficauda* under the name *Certhia cinnamomea*.

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* See papers P. Z. S. 1859, p. 191, and 1869, p. 636.

(1827?) Temminck (Pl. Col. 38th and 52nd livr.) writes upon *Synallaxis* (which he places near *Malurus*), and describes and figures five new species, *S. rutilans*, *S. albescens*, *S. cinerascens*, *S. tecellata*, and *S. setaria*, all from Brazil. The last two are attributed to Auguste Saint-Hilaire's researches, the first three are probably based on Natterer's specimens.

(1830.) Kittlitz, in his article on certain birds from Chili (Mém. pr. Ac. Sc. St. Petersburg), describes and figures two Chilian species, *S. humicola* and *S. ægithaloides*.

(1830.) P. Z. S. p. 30, Captain King describes *S. anthoides* from Patagonia.

(1831.) P. Max. (Beitr. z. Nat. v. Brasil. iii. p. 683 *et seq.*) describes the *Synallaxes* met with by him in S.E. Brazil. These are:—1. *S. cinereus* (=*S. ruficapilla*, Vieill.); 2. *S. pallidus*, sp. opt.; 3. *S. caudacutus* (=*S. cinnamomea*); and 4. *S. torquatus*, sp. opt.

(1837.) In their "Synopsis Avium," published in the 'Magasin de Zoologie' for this year, MM. Lafresnaye and d'Orbigny publish an account of the *Synallaxes* obtained by the latter during his celebrated journey in South America. Fourteen species are enumerated, whereof nine are described as new. These species are again described at fuller length in the fourth volume of D'Orbigny's 'Voyage dans l'Amérique Méridionale,' issued 1835–44.

The following table shows the results of my identification of D'Orbigny's *Synallaxes* as arranged in the last-mentioned work:—

Name of D'Orb.	Page.	Plate.	Name adopted by P. L. S.
1. *S. dorsomaculatus*	237	xiv. fig. 2.	*Phlœocryptes melanops.*
2. *S. maluroides*...........	238	xiv. figs. 3, 4.	*S. maluroides.*
3. *S. troglodytoides*	...	......	Sp. dub.
4. *S. phryganophilus*......	239	......	*S. phryganophila.*
5. *S. ruficauda*	240	......	*S. cinnamomea.*
6. *S. striaticeps*	241	xvi. fig. 1.	*S. striaticeps.*
7. *S. albiceps*	...	xvi. fig. 2.	*S. albiceps.*
8. *S. fuliginiceps*	242	xvii. fig. 1.	*Leptasthenura fuliginiceps.*
9. *S. ægithaloides*	243	......	*Leptasthenura ægithaloides.*
10. *S. leucocephalus*.........	244	......	Sp. dub.
11. *S. humicola*	245	xvii. fig. 2.	*S. orbignii.*
12. *S. ruficapilla*	246	......	*S. frontalis.*
13. *S. asaræ*..................	...	......	Sp. dub. (=*frontalis*?).
14. *S. maximiliani*	247	xv. fig. 1.	*S. maximiliani.*
15. *S. torquatus*	248	xv. fig. 2.	*S. torquata.*
16. *S. patagonica*...........	249	......	*S. patagonica.*

(1838.) Rev. Zool. p. 165. Lafresnaye and D'Orbigny describe *S. candæi* from Cartagena.

(1839.) Rev. Zool. p. 105. Lesson describes *S. sordida* from Chili.

(1840.) In the third volume of the 'Zoology of the Voyage of the Beagle' eight species of *Synallaxis* are included as having been met with in South America. Four are described as new—*S. major* (=*Anumbius acuticaudatus*), *S. rufogularis* (=*S. anthoides*), *S. flavogularis* (=*S. sordida*), and *S. brunnea* (=*S. sordida*, jr.).

(1843.) Revue Zoologique, p. 290. Lafresnaye describes five new species of *Synallaxis* in an article upon new Columbian birds:—*S. unirufa, fuliginosa, brachyura, gularis,* and *cinnamomea*. These are all good species except *S. brachyura*, which I cannot make out. In 1859 I changed the name *cinnamomea* to *læmosticta*, as there was already a *S. cinnamomea* (Linn.).

(1846.) Mr. G. R. Gray gives a list of thirty-five (then) described species of *Synallaxis* in Gray and Mitchell's 'Genera of Birds.'

(1847.) Sir W. Jardine describes *S. terrestris* from Tobago. Ann. N. H. xix. p. 80.

(1848.) Cabanis, in Schomburgk's 'Reisen in Britisch Guiana' (iii. p. 689), mentions only two *Synallaxes*, *S. ruficauda* (i.e. *S. cinnamomea*) and *S. ruficapilla*, which is =*S. frontalis*.

(1850.) Bonaparte, in his 'Conspectus,' gives a list of thirty-two species of *Synallaxis*.

(1850.) Sir W. Jardine (Contr. Orn. p. 82, pl. 56) describes and figures *S. flammulata* from Ecuador.

(1851.) Eyton describes two new *Synallaxes* in 'Contr. to Orn.' p. 150, *S. olivascens* (=*S. ruficapilla*) and *S. modesta*.

(1852.) Reichenbach, in his 'Handbuch d. Speciellen Ornithologie,' gives his account of *Synallaxis*. Being a mere compilation, with little reference to actual specimens, it is, like the rest of this author's work, replete with gross errors. The true *Synallaxes* are scattered amongst the (so-called) genera *Synallaxis, Leptasthenura, Bathmidura, Melanopareia, Cranioleuca, Asthenes, Leptoxyura,* and *Siptornis*. In the middle of these are placed the Australian *Orthonyx* and the *Clitonyx* (sive *Mohoua*) of New Zealand! The new species described are *Leptoxyura semicinerea* and *Bathmidura d'orbignii*, both which (specific) names are adopted here.

(1854.) Burmeister gives an account of the Brazilian *Synallaxes* in his 'Syst. Uebersicht d. Thiere Brasiliens.' Two species of *Melanoparia* and eight of *Synallaxis* are given; but several of these were not met with by the author personally.

(1855.) P. Z. S. p. 75. I describe *S. erythrothorax* from Central-American skins.

(1856.) Ann. N. H. xvii. p. 466. I describe *S. castanea* from Venezuela.

(1856.) Burmeister, in his 'Syst. Uebersicht d. Thiere Brasiliens' (vol. iii. p. 37 *et seq.*), gives an account of the S.E. Brazilian species, but introduces *S. maximiliani*, which does not occur in Brazil, referring it and its near ally *S. torquata* to *Melanopareia*, Reich. The species met with by Burmeister himself appear to have been only *S. torquata*, *S. spixi* (sub nom. *S. albescens*), *S. pallida*, and *S. cinnamomea* (called *S. mentalis*). These, however, are not very clearly distinguished in every case.

(1856.) P. Z. S. pp. 25, 97. I describe four new species of *Synallaxis*—*S. elegans*, *S. mœsta*, *S. spixi*, and *S. caniceps*. Of these, *S. elegans*=*S. frontalis*, v. Pelzeln.

(1857.) P. Z. S. p. 273. I describe *S. multostriata* from specimens in the Jardin des Plantes. But this =*S. flammulata*, Jardine, (1858.) P. Z. S. p. 62. In my account of a collection from the Rio Napo two supposed new species of *Synallaxis* are described as *S. albigularis* and *S. brunneicauda*. The former I now refer to *S. albescens*.

(1858.) P. Z. S. p. 457. I describe *S. antisiensis* from Ecuador.

(1859.) P. Z. S. p. 191. I describe as new *S. pudica*, *S. stictothorax*, and *S. scutata*, and give a complete list of the known species and a table of their geographical distribution.

(1859.) Pelzeln (Sitz. Ak. Wien, xxxiv. p. 101 *et seq.*) describes the *Synallaxes* in the Imperial Cabinet collected by Natterer. *S. propinqua*, *S. alopecias*, and *S. hypostícta* are described as new.

(1859.) Cabanis and Heine (Mus. Hein. ii. p. 27) give four species of *Synallaxis* as represented in Heine's Museum. One, *S. ruticilla*, is described as new, and Buffon's 'Pl. Enl.' 686. fig. 2 is identified, whereby it is shown that *Anabates*=*Synallaxis*.

(1860.) P. Z. S. p. 66. I describe as new *S. erythrops* from Ecuador.

(1861.) Burmeister, in the second volume of his 'La-Plata Reise,' enumerates the *Synallaxes* of the Argentine Republic. These he makes eight in number, namely :—

Synallaxis humicola (=*S. orbignii* of my nomenclature).
—— *flavigularis* (=*S. sordida*).
—— *ruficapilla* (=*S. frontalis*).
—— *fuliginiceps* (=*Leptasthenura fuliginiceps*).
—— *phryganophila*.
—— *ægithaloides* (=*Leptasthenura ægithaloides*).
—— *striaticeps*.
—— *melanops* (=*Phlœocryptes melanops*).

(1866.) P. Z. S. p. 183 *et seq.* Sclater and Salvin record the *Synallaxes* obtained by Mr. E. Bartlett on the Ucayali. Two are described as new, *S. terricolor* and *S. vulpecula*. But, as subsequent investigations show, the former = *S. propinqua*, and the latter is hardly distinct from *S. vulpina*.

(1867.) The Chilian *Synallaxes* are enumerated by Sclater in an article on Chilian birds, P. Z. S. p. 324, and those of Whitely's collections in Western Peru, *ibid.* p. 985. But the species from the last locality named *S. orbignii* is wrongly determined, and = *S. arequipæ*.

(1868.) In their article on Mr. Hudson's Buenos-Ayrean collection (P. Z. S. pp. 140 & 141), Sclater and Salvin include four *Synallaxes*.—N.B. *S. albescens*, p. 140, is a *lapsus calami* for *Leptasthenura ægithaloides*. See P. Z. S. 1869, p. 632.

(1868.) Ann. L. New York, p. 105. Lawrence describes *S. rufigenis* as new, and includes two other species in his list of Costarican birds.

(1868.) P. Z. S. p. 636. Burmeister describes *S. sulphurifera*, and notes occurrence of *S. spixi* near Buenos Ayres.

(1869.) P. Z. S. p. 417. *S. arequipæ* (previously referred to *S. orbignyi*) is described by Sclater and Salvin. *Ibid.* p. 636. *S. curtata* is described and figured by Sclater.

(1870.) P. Z. S. p. 840. *S. wyatti* is described by Sclater.

(1871.) P. Z. S. p. 85. Remarks on *Synallaxis candæi* by Sclater.

(1872.) P. Z. S. p. 543 *et seq.* Mr. Hudson gives an account of the *Synallaxes* met with during his excursion to the Rio Negro of Patagonia—six species in all, which are determined by Sclater.

(1872.) Lawrence (Ann. Lyc. N. Y. x. p. 186) describes *S. maculata* (=*stictothorax*, mihi).

(1873.) Journ. f. O. p. 319. Cabanis describes three new *Synallaxes* from Jelski's Peruvian collections—*S. humilis*, *S. albicapilla*, and *Schizoeaca palpebralis*. A new genus, *Schizoeaca*, is made for the last species.

(1873.) P. Z. S. p. 269. In their article on the birds of Eastern Peru, Sclater and Salvin mention five species of *Synallaxis*.

The subdivision of the species of *Synallaxis* into minor groups is a task of no ordinary difficulty. Of the numerous genera into which it has been proposed by some authors to arrange them I adopt only *Oxyurus*, *Phleocryptes*, and *Leptasthenura*, which alone seem to me to present sufficient structural differences for recognition. This leaves a mass of nearly sixty species in *Synallaxis*, which may be separated into two sections according as the rectrices are ten or twelve in number.

I commence with the first of these subdivisions:—

Div. A. Synallaxes normales, rectricibus decem.

Sect. *a*. *Species pileo alis et cauda rufis.*

1. SYNALLAXIS RUFICAPILLA.

Synallaxis ruficapilla, Vieill. Nouv. Dict. xxxii. p. 310 (1819), et Enc. Méth. p. 622, et Gal. Ois. pl. 174; Sclater, P. Z. S. 1856, p. 97, et 1859, p. 192; Cat. A. B. p. 150; Burm. Syst. Ueb. iii. p. 38; Pelzeln, Sitz. Akad. Wien, xxxiv. p. 116; Orn. Bras. p. 35.

Sphenura ruficeps, Licht. Doubl. p. 42.

Synallaxis cinereus, Max. Beitr. iii. p. 685.

Synallaxis olivascens, Eyton, Contr. Orn. 1851, p. 150.

Fusca: pileo toto, alis extus et cauda rufis: striga postsuperciliari flavicante: subtus cineracea, lateribus et crisso fusco perfusis: subalaribus pallide cervinis: long. tota 6, *alæ* 2·2, *cauda* 3 *poll.*

Hab. S.E. Brazil, prov. S. Paulo (*Natt.*).

The true *Synallaxis ruficapilla* of Vieillot is confined to the southern part of the wood-region of S.E. Brazil. It is easily distinguishable from its congeners by the extension of the rufous head over the front, and the slight yellowish stripe behind the eye, which separates the rufous cap from the dark cinereous sides of the head.

I have examined the typical specimens of *S. olivascens* in Mr. Eyton's collection. They belong to this species.

2. SYNALLAXIS FRONTALIS.

Synallaxis frontalis, Pelz. Sitz. Ak. Wien, xxxiv. p. 117 (1859), et Orn. Bras. p. 35; Reinh. Fuglef. Bras. Camp. p. 194.

Synallaxis ruficapilla, D'Orb. Voy. Ois. p. 246; Burm. La-Plata Reise, ii. p. 468; Darw. Zool. Beagle, iii. p. 79; Cab. in Schomb. Guian. iii. p. 685.

Synallaxis azaræ, D'Orb. Voy. Ois. p. 246.

Parulus ruficeps ♀, Spix, Av. Bras. i. p. 85, t. 86. fig. 2.

Synallaxis elegans, Sclater, P. Z. S. 1856, pp. 25, 98, and 1859, pp. 141, 191 (nec Lesson); Pelzeln, Sitz. Akad. Wien, xxxiv. p. 21.

Synallaxis ——?, Sclater, P. Z. S. 1858, p. 553.

Synallaxis elegantior, Sclater, Cat. A. B. p. 151 (1862).

Synallaxis poliophrys, Cab. J. f. O. 1866, p. 307.

Fusca: pileo rufo, fronte fusca: alis extus et cauda rufis: striga superciliari albescenti-cinerea: subtus cineracea: ventre medio albicante: hypochondriis et crisso fusco lavatis: long. tota 6, *alæ* 2·2, *caudæ* 3·2.

Hab. America tropica a Columbia ad remp. Arg.; Bogota (*Mus. P. L. S.*); Ecuador (*Fraser*); Western Peru (*Jelski*); Bolivia (*D'Orb.*); Guiana (*Schomb.*); Brazil, Bahia (*Wucherer*); Goyaz and Cujaba (*Natt.*); Corrientes, rep. Arg. (*D'Orb.*); Parana (*Burm.*).

Obs. Sp. a præcedente fronte fusca distinguenda.

After examining a large number of specimens of this form from different localities, I have come to the conclusion to unite them under v. Pelzeln's appropriate name. My name *elegans* was first given, founded upon Bogota skins, but changed to *elegantior* in 1862, on account of there being a *Synallaxis elegans* of Lesson. In the mean time, however, v. Pelzeln had bestowed the term *frontalis* upon Bolivian specimens.

Amongst the skins from the Jardin des Plantes intrusted to me for examination I find one of D'Orbigny's (Valle Grande, 1834), agreeing sufficiently well with the characters assigned to his *S. azaræ*. These are, however, in my opinion hardly sufficient to warrant specific distinction.

3. SYNALLAXIS MŒSTA.

Synallaxis mœsta, Sclater, P. Z. S. 1856, p. 26, and 1859, p. 193; Cat. A. B. p. 152.

Obscure brunnea fere unicolor, subtus magis cinerascens: pileo, nisi in fronte, alis extus et cauda rufis: rostro forti, pedibus crassis: long. tota 5·5, *alæ* 2·5, *caudæ* 2·8.

Hab. Columbia int. et rep. Æquator.

Obs. A *S. frontali*, rostro forti, pedibus crassis, cauda brevi et colore corporis obscuro satis diversa.

4. SYNALLAXIS BRUNNEICAUDA.

Synallaxis ruficapilla, Jelski, MS.

Synallaxis brunneicaudalis, Sclater, P. Z. S. 1858, pp. 62, 457, and 1859, p. 192; Cat. A. B. p. 152.

Fusco-rufescens, pileo toto usque ad frontem et alis extus rufis : cauda luridiore rufa : subtus fusca, in gutture cineraceo perfusa : long. tota 6, *alæ* 2·7, *caudæ rectr. med.* 2·8, *ext.* 0·9.

Hab. Rio Napo (*Verreaux*); vic. of Tarma, Western Peru (*Jelski*).

Mus. Varsoviano.

Obs. Species admodum fortis, cauda brevi graduata, colore rufo ad frontem extenso, necnon cauda luride rufa distincta.

I am a little doubtful whether my skin from Zamora, Ecuador (P. Z. S. 1859, p. 192), should be referred here or to *S. mœsta*, as it is quite immature.

Sect. *b. Species pileo et alis extus rufis ; cauda fusca.*

5. SYNALLAXIS SPIXI.

Parulus ruficeps, Spix, Av. Bras. i. p. 85, pl. 86. f. 1.

Synallaxis ruficapillus, Reichb. Handb. p. 158.

Synallaxis spixi, Sclater, P. Z. S. 1856, p. 98, et 1859, pp. 192, 196, et Cat. A. B. p. 151; Pelzeln, Sitz. Akad. Wien, xxxiv. p. 117, et Orn. Bras. p. 35; Reinh. Fuglef. Bras. Camp. p. 193; Burm. P. Z. S. 1868, p. 536; Scl. et Salv. P. Z. S. 1869, p. 632.

Synallaxis albescens, Burm. Syst. Ueb. iii. p. 39; Cab. et Hein. Mus. Hein. ii. p. 27.

Fusca : pileo usque ad frontem et alis extus rufis : subtus cinerea, ventre medio dilutiore, hypochondriis et crisso fuscescentibus : long. tota 6·5, *alæ* 2·1, *caudæ* 3·5.

Hab. Bras. merid. or. et rep. Arg. prov. S. Paulo (*Natt.*); Campos of Minas Geraes (*Lund*); Buenos Ayres (*Hudson*).

This appears to be the species figured by Spix as the *male* of his *Parulus ruficeps*, whence I named it *S. spixi*. It is not uncommon in collections from Rio, but does not appear to go much further north. Southward it extends to the vicinity of Buenos Ayres, where Mr. Hudson has obtained specimens.

6. SYNALLAXIS ALBESCENS.

Synallaxis albescens, Temm. Pl. Col. 227. f. 2; Sclater, P. Z. S. 1859, p. 192; Cat. A. B. p. 151; Scl. et Salv. P. Z. S. 1866, p. 183, 1868, p. 167, 1869, pp. 252 & 598; Salvin, P. Z. S. 1867, p. 143; Pelzeln, Sitz. Akad. Wien, xxxiv. p. 118, et Orn. Br. p. 36.

Synallaxis albigularis, Sclater, P. Z. S. 1858, pp. 63, 456, and 1859, p. 192, and Cat. A. B. p. 151; Scl. et Salv. P. Z. S. 1866, p. 183, 1868, p. 141, and 1873, p. 269.

Fusca : pileo, nisi in fronte, alis extus et cauda rufis : subtus dilutior, gula et ventre medio albis : long. tota 6, *alæ* 2·1, *caudæ* 2·7.

Hab. Veragua et inde Am. merid. usque ad remp. Arg.; Veragua (*Arcé*); Bogota (*Mus. P. L. S.*); Ecuador, Zamora (*Fraser*); Venezuela (*Goering*); Trinidad (*Mus. P. L. S.*); Guiana (*Mus. Berol.*); Nauta and Upper Ucayali (*Bartl.*); Pebas (*Hauxwell*); Cosnipata, W. Peru (*Whitely*); S.E. and Central Brazil and Lower Amazonia (*Natt.*); Mendoza (*Weisshaupt*); Buenos Ayres (*Hudson*).

Obs. Differt a *S. spixi* fronte fusca et gula albescente.

Of this *Synallaxis* I was for some time inclined to recognize two forms, a northern (*S. albigularis*) and a southern representative (*S. albescens*). Further investigation, however, has convinced me that it is better to reunite these, and to regard the whole as belonging to one rather variable species.

7. SYNALLAXIS HYPOSPODIA, sp. nov.

Fusca: pileo, nisi in fronte et alarum tectricibus extus rufis: subtus pallide cinerea, gutturis plumarum apicibus et ventre medio albis: hypochondriis et crisso fuscescentibus: cauda plumis latis, fuscis, apicem versus obscurioribus: long. tota 5·7, *alæ* 2·2, *caudæ* 3.

Hab. in Brasil. merid. prope Bahia (*Wucherer*).

Mus. P. L. S. et S.-G.

This form is common in collections from Bahia, but cannot be referred to any described species. From *S. albescens* it differs in the ashy plumage below, and from *S. subpudica* in its shorter and broader tail-feathers. *S. pudica* is nearly uniform dark cinereous below, and has more extended red on the outer wings.

8. SYNALLAXIS SUBPUDICA, sp. nov.

Fusca: pileo, nisi in fronte, cum nucha, tectricibus alarum et remigibus extus ad basin rufis: subtus pallide cinerea, gutturis plumis basin versus nigricantibus, hypochondriis et crisso fusco perfusis: cauda elongata, fusca unicolori: long. tota 6·5, *alæ* 2·2, *caudæ* 4·2.

Hab. in Columbia int.

Mus. P. L. S. et S.-G.

I have two "Bogota" skins of this form; and a third is in the collection of Salvin and Godman. I was at one time inclined to refer it to the young of *S. pudica*, but cannot satisfy myself that this would be correct. The distinguishing feature of the species is the long tail (measuring from 4·0 to 4·4) and the narrowness of the rectrices. The colour below is not uniform dark cinereous as in *S. pudica*, but more nearly resembles that of *S. hypospodia*, being pale cinereous, with the throat-feathers dark at their bases and silvery white at their tips, and the middle of the belly nearly white.

9. SYNALLAXIS PUDICA.

Synallaxis pudica, Sclater, P. Z. S. 1859, p. 191, and 1860, pp. 88, 278, 294; Cat. A. B. p. 151; Scl. et Salv. P. Z. S. 1864, p. 354.

S. brunneicaudalis, Lawr. Ann. L. N. Y. vii. p. 319.

S. nigrifumosa, Lawr. Ann. L. N. Y. viii. p. 180; Salv. P. Z. S. 1867, p. 143.

Supra fusca, pileo nisi in fronte et alis extus rufis: subtus obscure cinerea fere unicolor: long. tota 6·7, *alæ* 2·2, *caudæ* 3·3.

Hab. Columbia, Æquatoria, Panama et Costa Rica; Bogota (*Mus. P. L. S.*); Ecuador, Nanegal et Babahoyo (*Fraser*); Panama (*M'Clellan*); Chiriqui (*Arcé*); Costarica (*Carmiol*).

I originally established this species on a Bogota skin, from which Fraser's Ecuador specimens will hardly bear separation. The Panama and northern skins (*S. nigrifumosa*, Lawr.) are generally rather darker and more uniform below, but hardly more so than in two Bogota skins in Salvin and Godman's collection.

Sect. c. *Species pileo fusco; alis extus et cauda rufis.*

10. SYNALLAXIS GUIANENSIS.

Rouge-queue de Cayenne, Buff. Pl. Enl. 686. fig. 2.
Motacilla guianensis, Gm. S. N. i. p. 988.
Synallaxis guianensis, Cab. et Hein. Mus. Hein. ii. p. 27.
Sphenura cinnamomea, Licht. Doubl. p. 42.
Synallaxis inornata, Pelzeln, Sitz. Akad. Wien, xx. p. 161, & xxxiv. p. 120; Orn. Br. p. 36; Sclater, P. Z. S. 1859, p. 194.

Supra fusca: alis extus et cauda rufis: subtus valde dilutior, gutture et ventre medio albescentibus: long. tota 6, *alæ* 2·3, *caudæ* 3.

Hab. Guiana, Amazonia inferior et Columbia interior: Cayenne (*Buff.*); Surinam (*C. Bartlett*); Para (*Layard*); Borba and Rio Negro (*Natt.*); Bogota (*Mus. P. L. S.*).

There can, I think, be little doubt that this bird is the "*Rouge-queue de Cayenne*" of Buffon, and therefore the true type of Temminck's genus *Anabates*, as has been shown by Cabanis and Heine. I have examined the specimens in the Berlin Museum (from Para and Cayenne) marked *Sylvia* (serius *Sphenura*) *cinnamomea*. I have also a typical example of Pelzeln's *Synallaxis inornata*, which I think cannot be distinguished from other skins from Para, Cayenne, and Bogota.

11. SYNALLAXIS ALBILORA.

Synallaxis albilora, Pelzeln, Sitz. Akad. Wien, xx. p. 16, & xxxiv. p. 120; Orn. Br. p. 37; Sclater, P. Z. S. 1859, p. 193.
Synallaxis modesta, Natt. MS.

Supra fusca: alis extus et cauda rufis: subtus cinnamomea ventre dilutiore, gutture et loris albescentibus: long. tota 6, *alæ* 2·4, *caudæ* 3.

Hab. in Brasil. int. prov. Cuyaba et Matogrosso (*Natt.*); Bolivia (*Bridges*).

This species, of which I have a typical example received from Vienna, is very closely allied to *S. guianensis*. The white lores are not a sufficient distinction, as they are quite as white in some specimens of the latter. But the body below is cinnamomeous in the present bird, and it is possible that the two species may be really distinct. A Bolivian skin (collected by Bridges) in the British Museum appears to be referable to this species.

12. SYNALLAXIS CINERASCENS.

Synallaxis cinerascens, Temm. Pl. Col. 227. fig. 3; Pelzeln, Orn. Bras. p. 36.

Supra murino-fusca unicolor: alis extus et cauda (luridiore) rufis: subtus cinerea, lateribus et crisso fuscescentibus; gulæ plumis ad basin nigris, ad apicem albescentibus: long. tota 5·1, *alæ* 2·1, *caudæ* 2·6.

Hab. Brasil. merid. orient. prov. S. Paulo et Parana (*Natt.*).

This is a rather small and weakly formed species, obtained, so far as I know, only by Natterer. I have one of his typical specimens, and have seen others in the Museums of Berlin and Vienna.

13. SYNALLAXIS PROPINQUA.

Synallaxis propinqua, Pelz. Sitz. Ak. Wien, xxxiv. p. 101, et Orn. Bras. p. 37.

Synallaxis terricolor, Scl. et Salv. P. Z. S. 1866, p. 183, and 1873, p. 269.

Anabates pulvericolor, Scl. P. Z. S. 1858, p. 62 (ex MS. Lafr.) ?

Supra murino-fusca : alis extus et cauda luride rufescentibus : subtus albida fusco perfusa, gutturis plumis ad basin nigricantibus : rostro elongato : pedibus validis : tarsis elongatis : long. tota 6, *alæ* 2·2, *caudæ* 2·8 : *tarsi* 0·95.

Hab. Rio Madeira (*Natt.*) ; Amazonia sup. (*E. Bartlett*).

After comparing the type of *Synallaxis propinqua* (kindly lent to me for that purpose by the authorities of the Imperial Cabinet of Vienna) with examples of *S. terricolor* (founded by Mr. Salvin and myself on Mr. Bartlett's Upper-Amazonian specimens), I have come to the conclusion that they must be referred to the same species. The typical specimen of *S. propinqua* is slightly tinged with rufescent above, but is otherwise scarcely different.

14. SYNALLAXIS STICTOTHORAX. (Plate II. fig. 1.)

Synallaxis stictothorax, Sclater, P. Z. S. 1859, p. 191.

Synallaxis maculata, Lawr. Ann. L. N. Y. x. p. 186 (1872).

Murino-brunnea, uropygio rufescente : alis caudaque intus nigricanti-brunneis, extus rufo late limbatis : superciliis a fronte et lateribus cervicis albidis, nigro obsolete punctatis : subtus alba, lateribus et ventre imo rufescentibus : pectore toto maculis triangularibus nigricantibus asperso : rostro nigro, basi alba, pedibus fuscis ; long. tota 4·75, *alæ* 2, *caudæ* 2·25, *tarsi* 0·75.

Hab. Æquatoria occ.

Mus. Brit. ex Guayaquil (*Barclay*) ; Gul. Jardine Bart. ex Æquatoria.

The figure of this *Synallaxis* is from the typical specimen in the British Museum. In the Jardin des Plantes are four skins—three sent from Guayaquil by Mr. Rémy, and the fourth collected by Eydoux on the island of Puna.

15. SYNALLAXIS SEMICINEREA.

Leptoxyura semicinerea, Reich. Handb. d. Sp. O. p. 170, t. DXXI. fig. 3610 (1853).

Synallaxis caniceps, Scl. P. Z. S. 1856, p. 98, and 1859, p. 194.

Dorso alis extus et cauda rufis : pileo pallide cinereo : corpore subtus lactescenti-albo : rostro et pedibus flavidis : long. tota 5·5, *alæ* 2·4, *caudæ rectr. med.* 2·2, *ext.* 1·1.

Hab. Bolivia, Valle Grande (*D'Orb.*).

Mus. Dom. Eyt.

My acquaintance with this species was made in 1856 from specimens in the British Museum and in Mr. T. C. Eyton's collection. I have again examined these examples, and have recognized their identity with *Leptoxyura semicinerea* of Reichenbach, whose prior specific name is now adopted accordingly. An imperfect skin of this bird in the Jardin des Plantes was obtained by D'Orbigny in the Bolivian province of Valle Grande.

Synallaxis semicinerea is at once recognizable by its pale ashy head and uniform red back, wings, and tail, and in colour is quite unlike any other known species. Both specimens examined appear to have only ten rectrices. Mr. Eyton's skin was purchased of Parzudaki, and is labelled "Bahia."

16. SYNALLAXIS SCUTATA. (Plate II. fig. 2.)

Synallaxis scutata, Scl. P. Z. S. 1859, p. 191.

Supra murino-brunnea; dorso toto, alis extus et cauda rufis: superciliis ante oculum albis, post oculum magis cinnamomeis; remigum parte interna nigricante: subtus alba, pectore cinnamomeo lavato, plaga distincta quadrilaterali in cervice antica nigra: rostro plumbeo, basi pallidiore; pedibus pallide brunneis: long. tota 5·75, *alæ* 2·25, *caudæ* 2·75, *tarsi* 0·8.

Hab. Brasilia.

Mus. Brit.

The single example in the British Museum is the only specimen of this well-marked species that I have met with. It was obtained along with other birds from the Sudbury Museum in 1843, and is said to have been received from "Brazil."

Sect. *d*. *Species supra rufæ aut castaneæ unicolores.*

17. SYNALLAXIS CINNAMOMEA.

Certhia cinnamomea, Gm. S. N. i. p. 480; Vieillot, Gal. Ois. i. p. 283, pl. 173.

Synallaxis cinnamomea, Burm. Th. Bras. iii. pp. 41, 42; Pelz. Orn. Bras. p. 37.

Leptoxyura cinnamomea, Reichb. Handb. i. p. 170; Cab. et Hein. Mus. Hein. ii. p. 28; Sclater, Cat. A. B. p. 154; Scl. et Salv. P. Z. S. 1866, p. 183, 1867, p. 978, and 1873, p. 269.

Synallaxis ruficauda, Vieill. N. D. xxxii. p. 310 (1819), et E. M. p. 623; D'Orb. Voy. Ois. p. 240; Cab. in Schomb. Guian. iii. p. 689; Spix, Av. Bras. i. p. 84, pl. 85. fig. 2; Pelz. Orn. Bras. p. 37; Bp. Consp. i. p. 213; Scl. P. Z. S. 1859, p. 193.

Leptoxyura ruficauda, Reichenb. Handb. p. 170.

Sylvia russeola, Vieill. N. D. ii. p. 217, et E. M. p. 463.

Sphenura mentalis, Licht. Doubl. p. 42.

Synallaxis mentalis, Burm. Syst. Ueb. iii. p. 41.

Synallaxis caudacutus, Max. Beitr. iii. p. 692.

Supra ferruginea, pileo alis extus et cauda plerumque rufescentioribus: subtus alba, gula flavo tincta: rectricum apicibus exsertis acutis: long. tota 5·5, *alæ* 2·3, *caudæ* 2·6.

Hab. America merid. tropica a Columbia ad remp. Argentinam.

I have examined skins of this bird from Bogota, Venezuela (*Goering*), Trinidad, Guiana, Cayenne, Ceara in N. Brazil, Bahia (*Wucherer*), and other localities, and believe them to be all referable to one species. Several authors distinguish two, *S. cinnamomea* and *S. ruficauda*, the former having the back uniform with the wings, tail, and head, and the latter the back more or less fuscous, with the wings and tail rufous. But I find many intermediate forms between these two extremes.

18. SYNALLAXIS MUSTELINA.

"*Synallaxis cinnamomea*, Gm.," Pelz. Orn. Bras. p. 37.

"*Synallaxis mustelina*, Natt. Cat. MS.," Pelz. *l.s.c.*

Supra unicolor castanea, remigum parte apicali intus nigricante: subtus alba unicolor: long. tota 5, *alæ* 2·3, *caudæ* 2: *rostro elongatiore, rectricibus acuminatis.*

Hab. Rio Madeira (*Natt.*); Pebas, E. Peru (*Cast. & Dev.*).

Obs. Diversa a *S. cinnamomea* corpore supra intensius ferrugineo et menti macula nulla, sed ejusdem formæ.

I cannot agree with H. v. Pelzeln in referring this species to the *Certhia cinnamomea* of the older authors, and have therefore adopted the MS. term *mustelina* as its title. Besides one of Natterer's specimens, kindly lent to me from Vienna, I have seen only three skins, collected by Castelnau and Deville at Pebas.

19. SYNALLAXIS VULPINA.

Synallaxis vulpina, Pelzeln, Sitz. Akad. Wien, xx. p. 162, & xxxiv. p. 122, et Orn. Bras. p. 37; Sclater, P. Z. S. 1859, p. 194, et Cat. A. B. p. 152.

Synallaxis alopecias, Pelz. Sitz. Ak. Wien, xxxiv. p. 101.

Synallaxis vulpecula, Scl. et Salv. P. Z. S. 1866, p. 184, and 1873, p. 269.

Supra saturate ferruginea, uropygio fuscescente: superciliis albis: subtus pallide fusca, gutture et pectore albicantioribus: long. tota 5·2, *alæ* 2·7, *caudæ* 2·3.

Hab. Brasil. int. prov. Matogrosso, Rio Madeira et Amazonia inf. (*Natt.*); Amazonia superior (*Bartlett*).

After comparing together typical specimens of the three species above mentioned I have come to the conclusion that they may be united. An Upper-Amazonian skin in my collection agrees very fairly with the type of *S. alopecias*, whereas the skins from the same district upon which *S. vulpecula* was founded agree better with *S. vulpina*. At the same time further comparison should be made of specimens of this form from different localities.

20. SYNALLAXIS UNIRUFA.

Synallaxis unirufa, Lafr. P. Z. S. 1843, p. 290; Sclater, P. Z. S. 1855, p. 141.

Castanea unicolor, cauda elongata, rostro et pedibus nigris: long. tota 7, *alæ* 2·4, *caudæ* 3·8.

Hab. Columbia int.

This species is occasionally met with in collections from Bogota. Mr. Salmon has recently sent skins from Antioquia, showing that its range extends to that district of Columbia.

21. SYNALLAXIS CASTANEA.

Synallaxis castanea, Sclater, Ann. & Mag. N. H. ser. 2, xvii. p. 466 (1856); Sclater, P. Z. S. 1859, p. 193; Cat. A. B. p. 152; Scl. et Salv. P. Z. S. 1868, p. 627, and 1870, p. 781.

Castanea, gutture medio nigro : rostro et pedibus nigris : long. tota 7·5, *alæ* 2·3, *caudæ* 4.

Hab. Venezuela; Caracas (*Levraud*); Merida (*Goering*).

This *Synallaxis* is of the same form as the preceding, but easily known by its black throat. It is not uncommon in Venezuelan collections.

22. SYNALLAXIS KOLLARI. (Plate III. fig. 1.)

Synallaxis kollari, Pelzeln, Sitz. Ak. Wien, xx. p. 158 (1856), et Orn. Bras. p. 36.

Supra castanea, pileo fuscescente : subtus dilutior, ventre medio albicante : gutture nigro, plumis albo singulatim punctatis : long. tota 5·6, *alæ* 2·2, *caudæ* 2·7.

Hab. Guiana int. Rio Brancho (*Natt.*).

I am not aware that any other specimens have been obtained of this well-marked species since the original examples were collected by Natterer near Fort S. Joachim on the Rio Brancho in 1831 and 1832.

23. SYNALLAXIS CANDÆI. (Plate III. fig. 2.)

Synallaxis candæi, Lafr. et D'Orb. R. Z. 1838, p. 168; Bp. Consp. i. p. 213; Scl. P. Z. S. 1871, p. 85.

Castanea : pileo et capitis lateribus sordide nigris : mento et gulæ lateribus utrinque albis : gula media nigra : ventre medio albo : cauda castanea, rectricibus mediis nigricante terminatis : long. tota 6, *alæ* 2·3, *caudæ rectr. med.* 3, *lat.* 1·2.

Hab. Cartagena (*Candé*); Rio Hacha (*Del.*); Savanilla (*Ashurst*).

This well-marked species seems to be restricted to the northern littoral of Columbia. The figure is from a fine specimen collected by Mr. Bell at Cartagena, which Mr. Lawrence has most kindly presented to me.

24. SYNALLAXIS LÆMOSTICTA.

Synallaxis cinnamomea, Lafr. Rev. Zool. 1843, p. 290 (nec Gm.); Scl. P. Z. S. 1855, p. 141.

Synallaxis læmosticta, Sclater, P. Z. S. 1859, p. 192.

Obscure ferruginea : gula nigra, albo punctata : ventre medio cinnamomeo, nigricante obsolete striato : long. tota 5·5, *alæ* 2·2, *caudæ* 2·7.

Hab. Columbia int.

This *Synallaxis* is occasionally received in collections from Bogota, but is not very common.

25. SYNALLAXIS TERRESTRIS.

Synallaxis terrestris, Jard. Ann. & Mag. N. H. xix. p. 80 (1847); Bp. Consp. p. 213; Sclater, P. Z. S. 1859, p. 192; Scl. et Salv. P. Z. S. 1868, p. 167.

Obscure ferruginea: subtus magis brunnescens: gutture albo: pectore et ventre medio albis fusco flammulatis: long. tota 5·8, *alæ* 2·2, *caudæ* 2·5.

Hab. Tobago (*Kirk*); Venezuela (*Goering*).

Obs. Sp. gutture albo et pectore flammulato a præcedente forsan vix distincta.

26. SYNALLAXIS GULARIS.

Synallaxis gularis, Lafr. Rev. Zool. 1843, p. 29; Bp. Consp. p. 213; Sclater, P. Z. S. 1855, p. 141, 1859, p. 192, and 1860, p. 89; Scl. et Salv. P. Z. S. 1870, p. 781.

Cinnamomea, cauda rufa: fronte et superciliis albis: subtus dilutior (interdum cinerascens), gula alba: long. tota 5, *alæ* 2·4, *caudæ* 2.

Hab. Venezuela, Columbia int. et Æquatoria.

Three skins of this bird now before me from Bogota collections have the under surface more or less cinereous, whereas in two Ecuador skins (and in others I have seen) the under plumage is cinnamomeous, rather paler than the back. But a fourth Bogota skin resembles the Ecuadorian form; and even if the localities favoured the idea of separation, the difference would hardly be sufficient, in my opinion, for specific distinction.

27. SYNALLAXIS FULIGINOSA.

Synallaxis fuliginosa, Lafr. Rev. Zool. 1843, p. 290; Bp. Consp. p. 213; Sclater, P. Z. S. 1855, p. 141, 1856, p. 26, and 1859, p. 192.

Supra brunnea: superciliis et corpore subtus cinereis: mento albo: cauda elongata, rectricibus rigidiusculis, gracilibus, harum pogoniis angustis et tenuibus: long. tota 6·8, *alæ* 2·5, *caudæ* 4.

Hab. Columbia int.

This *Synallaxis* is only met with in Bogota collections. It is remarkable for its long tail, composed of narrowly webbed and rather stiffened rectrices.

28. SYNALLAXIS PALPEBRALIS.

Schizoeaca palpebralis, Cab. J. f. O. 1873, p. 319.

Supra obscure rufa: annulo oculari lato albo: subtus cinerea, lateribus et crisso fuscescentioribus: macula gulari rufa: caudæ rectricibus duodecim, rigidiusculis e plumis filamentosis compositis: long. tota 7·2, *alæ* 2·4, *caudæ rectr. med.* 4·3, *ext.* 1.

Hab. Peruvia occ., Maraynioc (*Jelski*).

Mus. Varsoviano.

Obs. Proxima *S. fuliginosæ* ex Columbia, et cauda simili, sed annulo oculari albo et macula gulari diversa.

29. Synallaxis erythrothorax.

Synallaxis erythrothorax, Sclater, P. Z. S. 1855, p. 75, pl. 86, 1856, p. 288, and 1859, p. 192; Scl. et Salv. Ibis, 1859, p. 117, and 1860, p. 35; Scl. Cat. A. B. p. 153; Scl. et Salv. P. Z. S. 1870, p. 837.

Synallaxis cinerascens, Bp. P. Z. S. 1837, p. 118 (?).

Supra fusca: alis extus castaneis: cauda luride rufa: subtus castanea, gutture nigro, in parte superiore albo punctato: ventre toto et crisso fuscis, illo medialiter albescente: long. tota 6·3, *alæ* 2·3, *caudæ* 2·8. Jr. *fusca fere unicolor, subtus dilutior, gutture et ventre cinerascentibus: alis extus et cauda rufis.*

Hab. Mexico et Am. centr.: Cordova (*Sallé*); Guatemala, Vera Paz (*Salvin*); Honduras (*Whitely*).

This well-marked species is the only representative of the genus in Mexico and Guatemala.

Sect. *e*. *Species pectoris torque nigro.*

30. Synallaxis torquata.

Synallaxis torquata, Max. Beitr. iii. p. 697; D'Orb. Voy. Ois. p. 248; Bp. Consp. p. 213; Sclater, P. Z. S. 1859, p. 193; Cat. A. B. p. 153; Pelzeln, O. B. p. 36; Reinh. Fuglef. Bras. Camp. p. 195.

Melanopareia torquata, Reichb. Handb. p. 164; Burm. Syst. Ueb. iii. p. 37.

Synallaxis bitorquata, Lafr. et D'Orb. Syn. Av. p. 24; D'Orb. Voy. Ois. t. xv. fig. 2.

Supra rufescenti-fusca, collo postico castaneo: loris et capitis lateribus torque pectorali conjunctis nigris: superciliis elongatis cinnamomeis nigro mixtis: subtus cinnamomea, lateraliter fuscescentior: alis et cauda brunneis: cauda brevi: long. tota 5, *alæ* 2, *caudæ* 2·2.

Hab. Brasil. int. et Bolivia; prov. S. Paulo (*Natt.*); Lagoa Sta. (*Lund*); Bolivia, Chiquitos (*D'Orb.*).

31. Synallaxis maximiliani.

Cola aguda pardo collar negro, Azara, Apunt. ii. p. 264.

Synallaxis torquata, Lafr. et D'Orb. Syn. Av. p. 24; D'Orb. Voy. Ois. t. xv. fig. 11.

Synallaxis maximiliani, D'Orb. Voy. Ois. p. 248.

Melanopareia maximiliani, Burm. Syst. Ueb. iii. p. 37.

Similis præcedenti, sed colore abdominis castaneo et striis corporis et cervicis albis distinguenda: long. tota 6, *alæ* 2·1, *caudæ* 2·6.

Hab. Paraguay (*Azara*); Bolivia, Yungas (*D'Orb.*).

Mus. Brit.

Sect. *f*. *Species cauda longissima: interscapulio striato.*

32. Synallaxis phryganophila.

Horqueta tricolor, Azara, Apunt. ii. p. 255.

Sylvia phryganophila, Vieill. Nouv. Dict. xi. p. 207, et Enc. Méth. p. 460; Hartl. Ind. Az. p. 15.

Synallaxis phryganophila, D'Orb. Voy. Ois. p. 239; Bp. Consp. p. 213; Sclater, P. Z. S. 1859, p. 193, et Cat. A. B. p. 152; Pelz. O. B. p. 36; Burm. La-Plata Reise, ii. p. 469.
Synallaxis tecellata, Temm. Pl. Col. 311. f. 1.

Fusca: dorso superiore fronte et alis extus nigro striatis: tectricibus alarum minoribus cum pileo summo rufis: subtus pallide fusca; mento flavo: plaga gutturali nigra; cauda elongata fusca, rhachibus nigricantibus: long. tota 8·5, *alæ* 2·4, *caudæ* 4·6.

Hab. Corrientes, rep. Arg. (*D'Orb.*); Parana (*Burm.*); Paraguay (*Azara*); Monte Video (*Sellow*); Cuyaba (*Natt.*).

This well-marked species stands quite by itself as regards plumage and form. The rectrices are much graduated, the small outer pair measuring only 1·4 inch from the insertion.

Sect. *g*. *Species cauda breviuscula nigricante: rostro fortiusculo.*

33. SYNALLAXIS RUTILANS.

Synallaxis rutilans, Temm. Pl. Col. 227. f. 1; Bp. Consp. p. 213; Pelzeln, Sitz. Akad. Wien, xxxiv. p. 119, et Orn. Bras. p. 36; Sclater, P. Z. S. 1859, p. 193; Scl. et Salv. P. Z. S. 1867, pp. 574, 750, and 1873, p. 269.

Brunnea: fronte, alis extus et corpore subtus castaneis: gutture nigro: ventre medio et crisso fuscescentibus: cauda nigricante: long. tota 5·3, *alæ* 2·3, *caudæ* 2·6. Jr. *obscure fusca; gutture nigricante; alarum tectricibus castaneis.*

Hab. Brasilia int. et Amazonia: prov. Goiaz et Matogrosso (*Natt.*); Para (*Wallace*); Rio Negro (*Natt.*); Xeberos, Chamicuros, and Chyavitas, E. Peru (*Bartlett*).

This is also a well-marked species, which seems to stand by itself. It has rather a wide distribution, as will be seen by the list of localities.

Div. B. Synallaxes abnormales, rectricibus duodecim.

Sect. *a*. *Species pileo, alis extus et cauda tota rufis.*

34. SYNALLAXIS PALLIDA.

Synallaxis pallida, Max. Beitr. iii. p. 691; Bp. Consp. p. 213; Sclater, P. Z. S. 1859, p. 192, et Cat. A. B. p. 150; Pelz. O. B. p. 38; Reinh. Fuglef. Bras. Camp. p. 192.
Synallaxis pusilla, Mus. Berol.

Fusca: superciliis elongatis albis: pileo, alis extus et cauda tota rufis: subtus dilutior: long. tota 6, *alæ* 2·5, *caudæ* 2·8.

Hab. Brasil. merid., Campos Geraes (*Max.*); Rio et S. Paulo (*Natt.*).

35. SYNALLAXIS ANTISIENSIS.

Synallaxis antisiensis, Sclater, P. Z. S. 1858, p. 457, and 1859, p. 192; Cat. A. B. p. 151.

Fusca : loris et superciliis albis : pileo, alis extus et cauda rufis : subtus cinerascenti-alba : long. tota 6, *alæ* 2·8, *caudæ* 3.

Hab. Rep. Æquat. Cuenca (*Fraser*).

Obs. A *S. pallida* crassitie majore, rostro et pedibus fortioribus et corpore subtus cineraceo diversa.

36. SYNALLAXIS CURTATA.

Synallaxis curtata, Sclater, P. Z. S. 1869, p. 636, pl. xlix. fig. 1.

Fusca : subtus paulo dilutior : pileo summo, alis extus et cauda tota rufis : long. tota 5, *alæ* 2·6, *caudæ* 2·3.

Hab. Columbia int. et Peruvia occ.

Obs. Affinis *S. pallidæ*, sed superciliis albis nullis.

Mus. P. L. S. et Varsoviano.

A skin collected by M. Jelski in Western Peru, near Tarma, seems not different from my Bogota specimens.

37. SYNALLAXIS ERYTHROPS.

Synallaxis erythrops, Sclater, P. Z. S. 1860, p. 66; Cat. A. B. p. 151; Lawr. Ann. L. N. Y. ix. p. 105; Salvin, P. Z. S. 1870, p. 191.

Fusca : pileo cum capitis lateribus, alis extus et cauda tota rufis : subtus paulo dilutior : long. tota 5·7, *alæ* 2·8, *caudæ* 3.

Hab. Rep. Æquat.; Pallatanga (*Fraser*); Loxa (*Mus. Gould*); Veragua (*Arcé*); Costa Rica (*Carm.*).

Obs. A præcedentibus colore capitis rufo oculos cingente distincta.

38. SYNALLAXIS RUFIGENIS.

Synallaxis rufigenis, Lawr. Ann. L. N. Y. ix. p. 105 (1868); Salvin, P. Z. S. 1870, p. 191.

Fusca : pileo antico, alis extus et cauda tota rufis : capitis lateribus, cervice antica, ventre medio et crisso cinnamomeis : long. tota 5·5, *alæ* 2·6, *caudæ* 2·9.

Hab. Costa Rica (*Carmiol*).

Mus. Salvino-Godmannico.

Obs. Sp. affinis præcedenti, sed colore capitis lateralis et ventris medii cinnamomeo diversa.

There is a single specimen of this species in Salvin and Godman's collection, of which Mr. Salvin has spoken *l. s. c.* It appears to agree well with a skin belonging to Mr. Lawrence; and I have no doubt the species is valid.

39. SYNALLAXIS STRIATICOLLIS.

Synallaxis striaticollis, Lafr. Rev. Zool. 1843, p. 290; Scl. P. Z. S. 1855, p. 141; Bp. Consp. p. 213.

Sittasomus flammulata, Less. Tr. d'Orn. p. 315 (?).

Siptornis flammulata, Reich. Handb. p. 171, t. DXI.^{b}=DCI. (1851).

Fusca : superciliis albis : pileo, alis extus et cauda tota rufis :

remigibus interne nigris: subalaribus cinnamomeis: gutture et collo antico albo maculatis: long. tota 4·5, *alæ* 2·5, *caudæ* 1·9.

Hab. Columbia int.

I have only met with this species in Bogota collections. It appears to be the *Siptornis flammulata* of Reichenbach; but I think it very doubtful whether it is the *Sittasomus flammulata* of Lesson.

40. SYNALLAXIS HYPOSTICTA. (Plate IV. fig. 2.)

Synallaxis hyposticta, Pelz. Sitz. Ak. Wien, xxxiv. p. 102, et Orn. Bras. p. 38.

Fusca: pileo, alis extus et cauda tota rufis: subtus valde dilutior pectore maculis crebris nigris, ventrem versus evanescentibus, aspersa: mento flavo tincto: rostro valido elongato: long. tota 5·6, *alæ* 2·8, *caudæ* 2·4.

Hab. Rio Negro (*Natt.*); Pebas, Peru (*Cast. et Dev.*); Yuracares, Bolivia (*d'Orb.*).

H. v. Pelzeln has kindly sent me his unique specimen of this curious bird for examination. It was obtained by Natterer on the Rio Negro, opposite Boavista, in December 1830. It is rather a strongly formed species, but must, I think, be retained in the genus *Synallaxis*.

Among the skins in the Jardin des Plantes are three of this species—an adult and a young specimen obtained at Pebas by Castelnau and Deville, and an adult obtained by D'Orbigny in the province of Yuracares, Bolivia.

The figure (Plate IV. fig. 2) is taken from the typical example of Natterer. In the young bird the spots below are barely visible, and the throat and neck are suffused with rufous.

Sect. *b*. *Species pileo dorso concolori, striato aut substriato: alis extus et cauda rufis.*

41. SYNALLAXIS SUBCRISTATA. (Plate IV. fig. 1.)

Synallaxis inornata, Scl. et Salv. P. Z. S. 1868, p. 167 (err.).

Olivaceo-brunnea: pileo subcristato obscuriore, paulum striato: alis extus cum remigum marginibus externis rufis: subtus dilutior; tectricibus subalaribus et remigum marginibus internis cinnamomeis: rostro flavicante, pedibus pallide fuscis: long. tota 5·8, *alæ* 2·1, *caudæ* 2·7.

Hab. Venezuela, prope urbem Caracas (*Goering* et *Dyson*).

Mus. Brit. et P. L. S.

One of Mr. Goering's Venezuelan collections contained a single example of this species, which, however, was erroneously determined by Mr. Salvin and myself as *S. inornata*. There is one skin of the same species in the British Museum, also obtained near Caracas, by Dyson, and two in the Jardin des Plantes transmitted by M. Levraud from the same locality.

The nearest ally of the present bird is *S. ruticilla*, from which it may be distinguished by the want or very slight indication of the white eyebrows, by the red colour of the wings extending over the

outer edges of the primaries and secondaries, by the crested head and stronger bill.

42. SYNALLAXIS RUTICILLA.

Sphenura ruticilla et *S. guajacina*, Licht. in Mus. Berol.

Synallaxis ruticilla, Cab. et Hein. Mus. Hein. ii. p. 27 (1859).

Synallaxis fitis, Pelz. Sitz. xxxiv. p. 123 (1859), et Orn. Bras. p. 38.

Leptoxyura obsoleta, Reich. Handb. p. 171 (?).

Fusca, cauda tota et alarum tectricibus rufis: loris et superciliis longis albis: fronte et capitis lateribus albidis, fusco subobsolete striatis: subtus ochracescenti-alba, gula media flavicante tincta: ventre et lateribus cinereo indutis: long. tota 5·8, *alæ* 2·2, *caudæ rectr. ext.* 1·4, *med.* 2·9.

Hab. Brasil. merid. et Monte Video (*Sellow*); Curytiba, prov. Parana (*Natt.*).

Mus. Berol.

Obs. Species haud dissimilis *S. pallidæ*, sed fronte albido fusco striato et pileo non rufo, distinguenda.

Hr. v. Pelzeln having sent me for examination one of the types of his *S. fitis*, I have little hesitation in associating it with *S. ruticilla*, of which I have examined the typical examples in the Berlin Museum.

Hr. v. Pelzeln is probably correct in referring Reichenbach's *Leptoxyura obsoleta* to the present bird; but *Sylvia obsoleta* of the Berlin Museum (whence Reichenbach's name was originally derived) belongs to the next following species.

43. SYNALLAXIS STRIATICEPS.

Synallaxis striaticeps, Lafr. et D'Orb. Syn. Av. i. p. 22; D'Orb. Voy. Ois. p. 241, pl. 16. f. 1; Sclater, P. Z. S. 1859, p. 193; Burm. La-Plata Reise, ii. p. 469.

Phleocryptes striaticeps, Hudson, P. Z. S. 1872, p. 544.

Sylvia (sive *Synallaxis*) *obsoleta*, Mus. Berol.

Supra cinerea, pileo nigro striato: superciliis albis: alis fuscis, harum tectricibus extus cum cauda tota rufis: subtus lactescenti-alba: rostro longo, gracili, incurvo: long. tota 5·7, *alæ* 2·3, *caudæ* 2·4.

Hab. Rep. Argentina et Uruguay, Corrientes (*D'Orb.*); Buenos Ayres and Rio Negro of Patagonia (*Hudson*); Monte Video (*Sellow*); Mendoza (*Burm.*).

Sect. *c. Species pileo albo: alis extus et cauda rufis.*

44. SYNALLAXIS ALBICEPS.

Synallaxis albiceps, Lafr. et D'Orb. Syn. i. p. 23; D'Orb. Voy. p. 241, pl. xvi. fig. 2.

Supra cum alis et cauda rufa: pileo albo: capitis lateribus nigricantibus: subtus olivacea, gula albicante: long. tota 5·8, *alæ* 2·5, *caudæ rectr. med.* 2·5, *ext.* 1·5.

Hab. Sicasica, Bolivia (*D'Orb.*).

Mus. Brit.

45. SYNALLAXIS ALBICAPILLA.

Synallaxis albicapilla, Cab. J. f. O. 1873, p. 319.

Oleaginea, pileo summo lactescenti-albo : cauda tota et tectricum alarium marginibus rufis : subtus pallide terreno-fusca, medialiter albescens, gula capite fere concolori : rostro brevi, recto : pedibus crassis : tectricibus subalaribus et remigum marginibus interioribus cervinis : rectricibus duodecim : long. tota 6, *alæ* 2·8, *caudæ rectr. med.* 2·8, *ext.* 1·6.

Hab. Peruvia occ. Maraynioc (*Jelski*).

Mus. Varsoviano.

Sect. *d. Species supra unicolores : cauda rotundata, nigro-rufa aut fusco-rufa : gula nigro punctata aut rufo maculata.*

46. SYNALLAXIS HUMICOLA.

Synallaxis humicola, Kittl. Mém. prés. à l'Ac. Pétersb. 1830, p. 185, pl. 6; Darwin, Zool. Beagle, iii. p. 75; Bp. Consp. p. 212; Sclater, P. Z. S. 1859, p. 193, 1867, p. 324; Cat. A. B. p. 153; Phil. et Landb. Cat. Av. Chil. p. 12.

Supra cineraceo-fusca : tectricibus alarum minoribus rufis : superciliis albis : subtus dilutior, albicantior, gula alba nigro punctata : hypochondriis, crisso et tectricibus subalaribus ferrugineis : cauda nigricante, rectricibus lateralibus in pogonio exteriore rufescente tinctis : long. tota 6·8, *alæ* 2·3, *caudæ rectr. med.* 2·9, *ext.* 1·9.

Hab. Chili, near Valparaiso (*Darwin*); Valparaiso (*D'Orb.* et *Gaudichaud* in Mus. Paris).

47. SYNALLAXIS ORBIGNII.

Synallaxis humicola, D'Orb. Voy. Ois. p. 245, t. 17. fig. 2; Burm. La-Plata Reise, ii. p. 468.

Synallaxis crassirostris, Landb. J. f. O. 1868, p. 401.

Bathmidura d'orbignyii, Reichb. Handb. d. sp. Orn. p. 163.

Synallaxis orbignii, Scl. et Salv. P. Z. S. 1867, p. 986.

Supra cineraceo-fusca, alarum tectricibus et secundariis extus rufis : loris albidis : subtus lacteo-alba : gula media rufa : hypochondriis, crisso et subalaribus necnon secundariorum dimidio basali rufis : cauda media nigra, rectricibus duabus utrinque lateralibus et his proximarum basibus rufis : long. tota 6·5, *alæ* 2·6, *caudæ* 3.

Hab. Bolivia, Palca (*D'Orb.*); Rep. Arg. Mendoza (*Weisshaupt*); Paraná (*Burm.*).

Obs. Sp. a præcedente gulæ macula, secundariorum basibus rufis et rectricibus lateralibus rufis prorsus distinguenda.

Although D'Orbigny collected at Valparaiso specimens of the true *S. humicola,* the species figured under that name in his work is clearly distinct, as was first pointed out by Reichenbach.

I have compared one of D'Orbigny's skins of this species in the Paris Museum (collected at Cochabamba in 1834, and marked "*S. humicola*") with a specimen in my own collection obtained near Mendoza by Weisshaupt. I therefore do not doubt that I am correct in referring Landbeck's *S. crassirostris* (established on examples from the same locality) to this species.

48. SYNALLAXIS AREQUIPÆ.

Synallaxis orbignii, Scl. et Salv. P. Z. S. 1867, p. 986 (excl. syn.).

Synallaxis arequipæ, Scl. et Salv. P. Z. S. 1869, p. 417.

Supra fusca, pileo parum obscuriore, uropygio rufo: alis extus fusco-nigris, tectricibus et secundariis fusco indistincte marginatis: cauda nigra, rectrice una utrinque extima fere omnino et duabus utrinque proximis in pogonio exteriore rufis: subtus lacteo-alba, macula gulari, tectricibus subalaribus, hypochondriis et crisso rufis: rostro obscure corneo, pedibus nigris: long. tota 6·8, *alæ* 2·7, *caudæ* 3, *tarsi* 1.

Hab. Peruvia occ. prope Arequipa (*Whitely*).

Obs. Sp. gula, sicut in præcedente, rufa, sed secundariis nigris, neque extus et in dimidio basali intus rufis, distincta.

49. SYNALLAXIS MODESTA.

Synallaxis modesta, Eyton, Contr. Orn. 1851, p. 159; Scl. P.Z.S. 1867, p. 324, 1872, p. 544.

Synallaxis flavigularis, Burm. La-Plata Reise, ii. p. 468.

Synallaxis sordida, Ph. et Landb. Cat. Av. Chil. p. 13.

Supra cineraceo-fusca: superciliis indistincte albidis: alis fusco-nigris fusco limbatis, remigum parte interiore in dimidio basali et subalaribus læte fulvis: subtus valde dilutior, pallide ochraceo-cinerea, gulæ macula rufescente: cauda nigra, rectricibus externis fulvo externe limbatis: long. tota 6, *alæ* 2·3, *caudæ* 2·5.

Hab. Rio Negro of Patagonia (*Hudson*); Mendoza (*Burm.*); Chili (*Reed*).

Obs. Sp. a *Synallaxi sordida* cauda pictura distinguenda.

I have compared my specimens of this species with the type in Mr. Eyton's collection.

Mr. Salvin has a skin, obtained by Burmeister at Mendoza, marked *S. flavigularis*, which certainly belongs to this species, not to *S. sordida*.

50. SYNALLAXIS HUMILIS.

Synallaxis humilis, Cab. J. f. O. 1873, p. 319.

Supra fusca: alis caudaque nigricanti-fuscis rufescente extus limbatis: rectricibus lateralibus in centro pallidioribus et rufescente tinctis: subtus ochracescenti-alba: superciliis longis, capitis lateribus et gutture toto albis fusco striolatis: macula gulari rufa: subalaribus et macula magna ad basin remigum rufis: rostro elongatiore, recto: caudæ rectricibus duodecim: long. tota 6, *alæ* 2·8, *caudæ rectr. med.* 2·6, *ext.* 1·8.

Fœm. *mari similis, sed minor.*

Hab. Peruvia occ., Junin (*Jelski*).

Mus. Varsoviano.

Obs. Similis *S. modestæ*, sed marginibus rectricum rufis caret et rostro fortiore necnon superciliis distincta.

51. SYNALLAXIS SORDIDA.

Synallaxis sordida, Less. Rev. Zool. 1839, p. 105; Bp. Consp.

p. 213; Sclater, P. Z. S. 1859, p. 193, 1867, p. 324; Cat. A. B. p. 153; Hudson, P. Z. S. 1872, p. 543.

Synallaxis flavigularis, Gould, Voy. Beagle, Zool. iii. p. 78, pl. 24; Ph. et Landb. Cat. Av. Chil. p. 12.

"*Synallaxis rufa*, Landb. MS.," Scl. P. Z. S. 1867, p. 324.

Synallaxis brunnea, Gould, Voy. Beagle, iii. p. 78 (jr.).

Supra cineraceo-fusca: alis fusco-nigris rufescente limbatis: remigum parte interiore in dimidio basali et subalaribus fulvis: subtus valde dilutior, pallide ochraceo-cinerea, gulæ macula rufescente: caudæ rectricibus tribus externis omnino rufis, ceteris nigris, parte tertia extus anguste rufo limbata: long. tota 6, *alæ* 2·3, *caudæ* 3. Junior *macula gulari caret.*

Hab. Rep. Argentina, Mendoza (*Burm. et Weisshaupt*); Conchitas near Buenos Ayres and Rio Negro of Patagonia (*Hudson*); Port Desire, Bahia Blanca, and Sta. Cruz (*Darwin*).

Obs. Species a *S. modesta* rectricibus duabus externis omnino rufis distinguenda.

I have skins of this species from the first three localities mentioned, and have examined Darwin's specimens in the British Museum. Amongst the last are typical examples of *S. flavigularis* and *S. brunnea*.

Sect. *e*. *Species supra unicolor: cauda graduata acuminata: gulæ macula lutea.*

52. SYNALLAXIS SULPHURIFERA.

Synallaxis sulphurifera, Burm. P. Z. S. 1868, p. 636; Scl. et Salv. P. Z. S. 1869, p. 632; Hudson, P. Z. S. 1872, p. 544.

Supra fusca, alarum tectricibus et remigum fascia basali rufis: cauda graduata: rectricibus valde acuminatis, lateralibus rufis: mediis fuscis: subtus alba, gulæ macula lutea: pectore hypochondriis, crisso, et subalaribus fulvescentibus: long. tota 6, *alæ* 2·2, *caudæ rectr. med.* 3·2, *ext.* 1: *rostro elongatiore, incurvo.*

Hab. Rep. Argentina et Patagonia bor.: Buenos Ayres (*Burm.*); Rio Negro (*Hudson*).

This interesting species should perhaps be placed near to *S. striaticeps*, which it approaches as regards its graduated tail and slightly incurved bill. But it agrees with the last group in having a distinct gular patch. In habits, according to Mr. Hudson, it resembles *Limnornis curvirostris* rather than its congeners.

Sect. *f*. *Species supra unicolor: cauda rotundata: gulæ macula nulla.*

53. SYNALLAXIS PATAGONICA.

Synallaxis patagonica, D'Orb. Voy. Ois. p. 249; Hudson, P. Z. S. 1872, p. 544.

Supra murino-fusca: subtus dilutior, pallide cineracea: tectricibus subalaribus et remigum marginibus cervinis, ventre hoc colore perfuso: cauda brevi rotundata, rectricibus nigris, harum una utrinque extima in pogonio externo rufescente, ceterarum etiam latera-

lium marginibus externe rufescentibus: long. tota 6, *alæ* 2·2, *caudæ rectr. med.* 2·8, *ext.* 1·8.

Hab. Rio Negro of Patagonia (*D'Orb. et Hudson*).

This is a peculiar species, with the tail (comparatively) short, and the rectrices broad and rounded at their ends. I have compared Mr. Hudson's skins with D'Orbigny's typical specimens.

Sect. *g. Species supra nigro variegatæ aut striatæ: rectricibus acuminatis.*

54. SYNALLAXIS ANTHOÏDES.

Synallaxis anthoïdes, King, P. Z. S. 1830–31, p. 30; Bp. Consp. p. 213; Sclater, P. Z. S. 1859, pp. 193, 196, 1867, p. 324; Cat. A. B. p. 153.

Synallaxis rufogularis, Gould, Voy. Beagle, Zool. iii. p. 77, pl. 23; Phil. et Landb. Cat. Av. Chil. p. 12.

Sphenopyga rufigularis, Cab. et Hein. Mus. Hein. ii. p. 28.

Supra fusca nigro striata et variegata: subtus dilutior: gulæ macula rubra: fascia lata ad remigum basin rufa: subalaribus rufescentibus: caudæ rectricibus mediis nigris fusco marginatis, lateralibus rufescentibus ad basin nigris: long. tota 6, *alæ* 2·5, *caudæ rectr. med.* 2·5, *lat.* 1·5.

Hab. Chili, near Valparaiso, East Falkland, and valleys of southern Patagonia (*Darwin*); Chili (*Reed*).

In my American catalogue I gave "Bolivia (*Bridges*)" as a locality for some examples of this *Synallaxis*. I have now no doubt that these skins were really from Chili, as they agree exactly with others received from that country, and I have found other Chilian skins of Bridges marked "Bolivia."

55. SYNALLAXIS HUDSONI, sp. nov.

Synallaxis anthoides, Scl. et Salv. P. Z. S. 1868, p. 141.

Supra fusca nigro striata et variegata: subtus pallide ochracea, medialiter albescentior, hypochondriis et crisso nigro striolatis: gula flavicante: remigum fascia basali rufa: subalaribus et remigum marginibus interioribus cinnamomeis: caudæ rectricibus mediis dorso concoloribus, ceteris ad basin nigris ad apicem fuscescenti-cinnamomeis: long. tota 7·5, *alæ* 3·3, *caudæ rectr. med.* 3·5, *ext.* 2.

Hab. Rep. Arg. Conchitas prope Buenos Ayres (*Hudson*).

Mus. P. L. S.

Obs. Similis præcedenti, sed valde major, et gula flavicante necnon corpore subtus cinnamomeo diversa.

56. SYNALLAXIS WYATTI.

Synallaxis wyatti, Scl. et Salv. P. Z. S. 1870, p. 841; Wyatt, Ibis, 1871, p. 330.

Supra fusca, nigro striata: tectricum alarium marginibus et remigum macula magna basin occupante cum subalaribus rufis: subtus pallide ochracea, pectore paulo obscuriore et punctis paucis nigris asperso, gula alba flavicante tincta: caudæ rectricibus duodecim, *tribus lateralibus rufis, scapis nigris, cæteris nigricantibus rufo paulum variegatis: rostro elongato, acuto, corneo, ad basin pallidiore: pedibus fuscis: long. tota* 6, *alæ* 2, *caudæ rectr. lat.* 1·6, *med.* 2·8, *rostri a rictu* 0·7.

Hab. Paramo of Pamplona, Columbia (*Wyatt*).

Obs. Aff. præcedenti, sed alis extus et caudæ rectricibus lateralibus rufis prorsus distinguenda.

57. SYNALLAXIS FLAMMULATA.

Synallaxis flammulata, Jard. Contr. Orn. 1850, p. 82, pl. 56; Sclater, P. Z. S. 1859, p. 194, and 1860, p. 76.

Synallaxis multostriata, Scl. P. Z. S. 1857, p. 273; 1869, p. 636.

Supra fuscescenti-nigra, albo striata: pilei antici plumis rufo striolatis: tectricum alarium marginibus et fascia remigum basali lata rufis: subtus alba, nigricante variegata: mento albo, fulvo tincto: subalaribus fulvis: cauda nigra, rectricibus lateralibus rufescente variegatis: rectricum apicibus elongatis, acutis: long. tota 6, *alæ* 2·7, *caudæ rectr. med.* 3, *lat.* 1·6.

Hab. Columbia, Æquatoria et Peruvia: Bogota (*Mus. Paris*); Panza, Ecuador (*Fraser*); Loxa, Ecuador (*Mus. J. Gould*); Maraynioc, Centr. Peru (*Jelski*).

Like the preceding, this is a high-ranging Andean species. Fraser obtained it at Panza, situated at an altitude of 14,000 feet on the slope of Chimborazo.

58. SYNALLAXIS MALUROIDES.

Synallaxis maluroïdes, D'Orb. Voy. Ois. p. 238, pl. 14. f. 3, 4; Darwin, Zool. Voy. Beagle, iii. p. 77; Bp. Consp. p. 213; Sclater, P. Z. S. 1859, p. 193; Scl. et Salv. P. Z. S. 1868, p. 141.

Supra pallide fusca nigro variegata, pileo antico rufo: subtus alba: fascia pectoris indistincta, lateribus et crisso pallide fulvis, parce nigro striolatis: fascia ad basin remigum et rectricibus caudæ lateralibus pallide rufescentibus: alis brevibus: rectricum mediarum apicibus longis acuminatis: long. tota 6, *alæ* 1·8, *caudæ rectr. lat.* 1·5, *med.* 3.

Hab. Rep. Argentina et Uruguay; Maldonado (*Darwin*); vic. of Buenos Ayres (*Hudson et D'Orb.*).

This is a small short-winged species with long pointed middle tail-feathers, and easily recognizable by its red head.

APPENDIX OF DOUBTFUL SPECIES.

1. SYNALLAXIS BRACHYURA, Lafr. R. Z. 1843, p. 290; Scl. P. Z. S. 1855, p. 141.

Hab. Bogota.

It is possible this short description may be intended for a young specimen of *S. mœsta*; but "*cauda* obscura" is not applicable.

2. SYNALLAXIS LEUCOCEPHALUS, Lafr. et D'Orb. Syn. p. 24; D'Orb. Voy. Ois. p. 244.

Hab. Patagonia, Rio Negro, visa sed non capta!

3. **Synallaxis troglodytoides**, D'Orb. Voy. Ois. p. 239.

Hab. Bahia de San Blas, Patagonia (*D'Orb.*).

I have not been able to find any specimen of this species in the Jardin des Plantes.

4. **Synallaxis striata**, Ph. et Landb. Wiegm. Arch. 1863, p. 119.

Hab. Arica, Peru (*Frobeen*).

I know of no species exactly resembling that here described.

In conclusion I will offer a few remarks upon the geographical distribution of the *Synallaxes*.

The area occupied by this genus is nearly that of the whole Neotropical region from southern Mexico to Patagonia. In Mexico and Central America generally but one species is found, *S. erythrothorax*. It is not until we get to Costa Rica and Veragua that we meet with others, *S. albescens* and *S. erythrops*, intruders from the south, and *S. rufigenis*, an apparently endemic species. In the Columbian and Peruvian Andes *Synallaxis* appears to attain its greatest development, as many as fourteen species occurring in Columbia, and ten or more in Peru. In Guiana, Amazonia, Brazil, and eastern South America generally they are more thinly scattered, each district only showing about half that number of endemic species. In the southern part of South America a set of species occur belonging to a section of the twelve-tail-feathered division, which, in the northern part of the continent, is only met with at a high elevation in the Andes.

The subjoined Table will show the facts of distribution, so far as they are hitherto known, at a glance.

	1. Mexico and Guatemala.	2. Costa Rica and Veragua.	3. Columbia.	4. Ecuador.	5. W. Peru.	6. Upper Amazon.	7. Lower Amazon.	8. Guiana.	9. Venezuela, Trinidad, and Tobago.	10. S.E. Brasil.	11. Int. Brasil.	12. Bolivia.	13. Paraguay.	14. Rep. Arg.	15. Patagonia.	16. Chili.
1. ruficapilla ...	...	...	...	...	...	...	...	...	...	—						
2. frontalis	...	...	—	—	—	—	—	—	—	—	—	—	—			
3. mœsta	...	...	—	—												
4. brunneicauda	...	...	...	—	—											
5. spixi	...	...	...	...	...	...	...	...	...	—	—	...	—	—		
6. albescens......	...	—	—	—	—	—	—	—	—	—	—	—	—	—		
7. hypospodia...	...	...	...	...	...	...	...	...	...	—						
8. subpudica ...	...	...	—													
9. pudica.........	...	—	—	—												
10. guianensis ...	...	...	—	...	...	...	—	—								
11. albilora	...	...	...	...	...	...	...	...	...	...	—	—				
12. cinerascens...	...	...	...	...	...	...	...	...	...	—						
13. propinqua ...	...	...	...	...	...	—	—									
14. stictothorax	...	...	...	—												

	1. Mexico and Guatemala.	2. Costa Rica and Veragua.	3. Columbia.	4. Ecuador.	5. W. Peru.	6. Upper Amazon.	7. Lower Amazon.	8. Guiana.	9. Venezuela, Trinidad, and Tobago.	10. S.E. Brazil.	11. Int. Brazil.	12. Bolivia.	13. Paraguay.	14. Rep. Arg.	15. Patagonia.	16. Chili.
*15. semicinerea...	...	...	...	...	...	...	...	...	...	...						
*16. scutata	...	...	...	...	...	...	...	...	...	...						
17. cinnamomea	...	...	...	...	...	...										
18. mustelina ...	...	...	...	...	...											
19. vulpina	...	...	...	...	...											
20. unirufa	...	...														
21. castanea	...	...	...	...	...	...	...	...								
22. kollari.........	...	...	...	...	...	...	...									
23. candæi	...	...														
24. læmosticta ...	...	...														
25. terrestris......	...	...	...	...	...	...	...	...								
26. gularis	...	...														
27. fuliginosa ...	...	...														
*28. palpebralis...	...	...	...	...												
29. erythrothorax																
30. torquata......	...	...	...	...	...	...	...	...								
*31. maximiliani	...	...	...	...	...	...	...	...	...	...	...					
32. phryganophila	...	...	...	...	...	...	...	...	...	...						
33. rutilans	...	...	...	...	...											
34. pallida	...	...	...	...	...	...	...	...	...							
35. antisiensis ...	...	...	...													
36. curtata	...	...		...												
37 erythrops ...	...		...													
*38. rufigenis	...															
39. striaticollis...	...	...														
40. hyposticta ...	...	...	...	...	...		...		...	...	...					
41. subcristata ...	...	...	...	...	...	...	...	...								
*42. ruticilla	...	...	...	...	...	...	...	...	...							
43. striaticeps ...	...	...	...	...	...	...	...	...	...	...	...	...	...			
*44. albiceps	...	...	...	...	...	...	...	...	...	...	...					
*45. albicapilla ...	...	...	...	...												
46. humicola ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
47. orbignyii......	...	...	...	...	...	...	...	...	...	...	...		...			
48. arequipæ......	...	...	...	...												
49. modesta	...	...	...	...	...	...	...	...	...	...	...	...	...			
*50. humilis	...	...	...	...												
51. sordida	...	...	...	...	...	...	...	...	...	...	...	...	...			
52. sulphurifera	...	..	...	...	...	...	...	...	...	...	...	...	...			
53. patagonica ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
54. anthoïdes ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
55. hudsoni	...	...	...	...	...	...	...	...	...	...	...	...	...			
56. wyatti.........	...	...														
57. flammulata...	...	...														
58. maluroïdes...	...	...	...	...	...	...	...	...	...	...	...	...	...			
	1	4	14	10	9	7	7	5	7	10	9	10	5	10	6	4

* Of the nine species marked with an asterisk I have no specimens, and the characters are taken from examples contained in the Museums mentioned under the head of each species.

Fig. 2.

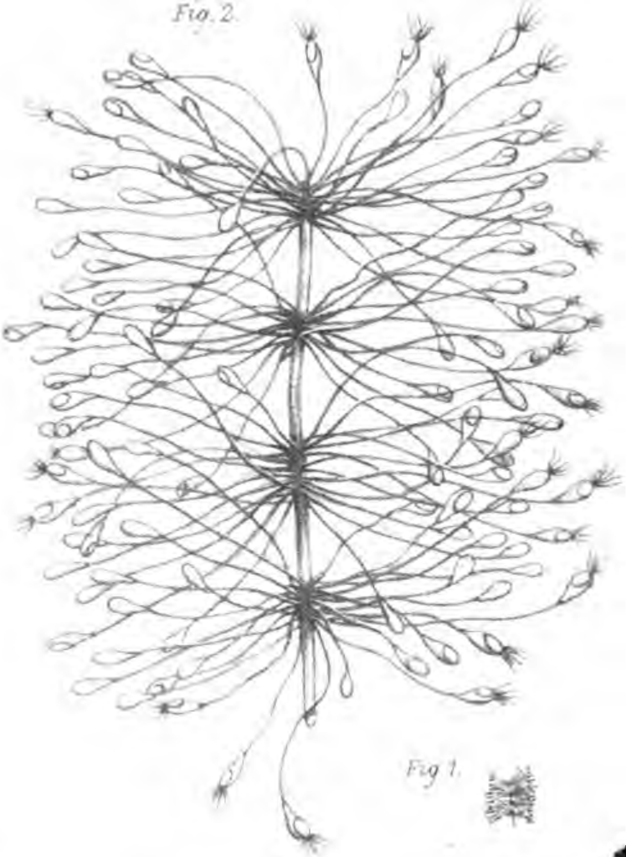


Fig 1.

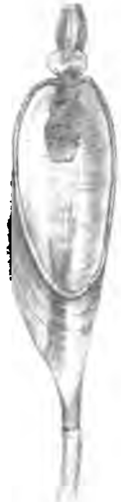


Fig 4.

Fig 6.

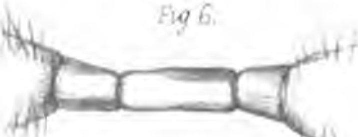
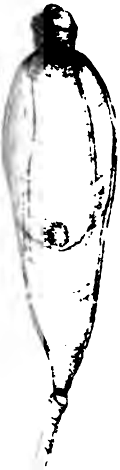


Fig 5.



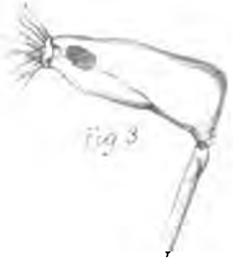


Fig 3.

J. Smit del. et lith.

M & N Hanhart imp.

HIPPURARIA EGERTONI.

2. Notice of a New Polyzoon (*Hippuraria egertoni*). By George Busk, F.R.S., V.P.Z.S., &c.

[Received November 26, 1873.]

(Plate V.)

The subject of the present communication is so peculiar in its conformation and in several respects so widely different from any other Polyzoon with which I am acquainted, that it seems desirable that some notice of it should be placed on record, although I am unable from want of materials to give a full account of its structure. This can only be made out from the examination of fresh or perfect specimens that have been preserved in spirit.

The only specimen at present available is not sufficient for the purpose, owing to its having been dried and reexpanded. I am indebted for it to Sir Philip Egerton, who discovered the species growing upon the carapace of a *Gonoplax angulatus* dredged up at Berehaven in the course of last summer. It will, no doubt, when once made known, be found in sufficient abundance; and the examination of it, in the living or recent state, will well reward the observer.

The specimen, which is preserved in the British Museum, consists apparently of only a portion of a larger growth. It is about a ¼ of an inch in length, and consists of a central tubular stem upon which are four nodular enlargements at nearly equal distances apart. From each of these nodes spring on all sides numerous slender transparent tubes, about 0″·13 long, each of which supports at the extremity a pyriform *zoœcium* about 0″·04 in length.

The central stem is a hollow, thick-walled, chitinous tube, obscurely jointed between the nodosities (Plate V. fig. 2). The latter, in the present condition of the specimen, are quite opaque; and consequently it is impossible to make out their exact relations to the tubular stem, or the precise mode of origin of the celliferous tubules which spring from them.

The tubules or peduncles, as they may be called, of the zoœcia are slender and very transparent, about $\frac{1}{500}$ of an inch in diameter, and smooth on the exterior. Internally they exhibit what appears to be an irregularly spiral filament; but the real nature of this structure has yet to be ascertaind. The zoœcia are seated at the extremities of the tubules, to which they appear to be connected by a joint. I have been unable to make out whether there is any communication between the tube and the cavity of the zoœcium.

The *zoœcia* or cells are of an elegant pyriform shape, somewhat gibbous on one side, which may be termed the dorsal, whilst on the opposite or anterior the zoœcium at first sight appears to be furnished with a wide aperture closed with a thin membrane similar to that which is met with in very many of the Cheilostomata (as *Bicellaria* &c.), in which area is placed the true mouth with its movable lip. Nothing of the kind, however, appears to exist in *Hippuraria*; and the apparent aperture represents the outline of a distinct smaller compartment of the zoœcium, placed as it were on the front of the larger or hinder one, and about half its length. The external walls of both compartments are very thin and transparent, and marked with fine irregular transverse lines.

The orifice through which the polypide is protruded appears to belong chiefly, if not entirely, to the smaller compartment, in which may be perceived a dark opaque body probably representing the contracted remains of the polypide, from which in several of the zoœcia the usual contractile, muscular funiculus proceeds. The two compartments seem to be separated by an obliquely vertical septum, in which may be obscurely perceived a circular opening*, through which the retractile muscle appears to pass to the bottom of the hinder compartment. Besides these structures there may be seen traces of other, probably muscular, bands in the larger compartments; but the whole of the internal economy has yet to be satisfactorily made out.

In most of the zoœcia the remains of the protruded polypide may still be seen projecting from the apical orifice. I have been unable to discern any fringe of setæ, but have no doubt that it will be found that, when the polypide is protruded, its base is surrounded with at least a membranous fringe, as is the case in many of the *Ctenostomata*.

Some idea of the appearance presented by the Polyzoon when alive may be formed from fig. 3 in the accompanying Plate, taken from a sketch made by Sir Philip Egerton. From this it would seem that the zoœcium, at any rate on occasion, is capable of being flexed to a right angle upon its peduncle, although in the dead specimen all the *zoœcia* are continued in a straight line with it.

For this interesting production I propose the name of *Hippuraria egertoni*, with the following diagnosis:—

Suborder CTENOSTOMATA.

Fam. HIPPURARIADÆ, n. fam.

Gen. HIPPURARIA, n. g.

Stem jointed, nodular, whorls of celliferous tubules arising from the nodes. *Zoœcia* two-celled.

Sp. HIPPURARIA EGERTONI, n. sp.

The only species.

Hab. Berehaven, Ireland (parasitic on *Gonoplax angulatus*).

DESCRIPTION OF PLATE V.

Fig. 1. *Hippuraria egertoni*, nat. size.
2. Enlarged about ten times.
3. Appearance when alive.
4. Anterior aspect of zoœcium.
5. Posterior aspect of zoœcium.
6. Portion of the central stem between two nodes.

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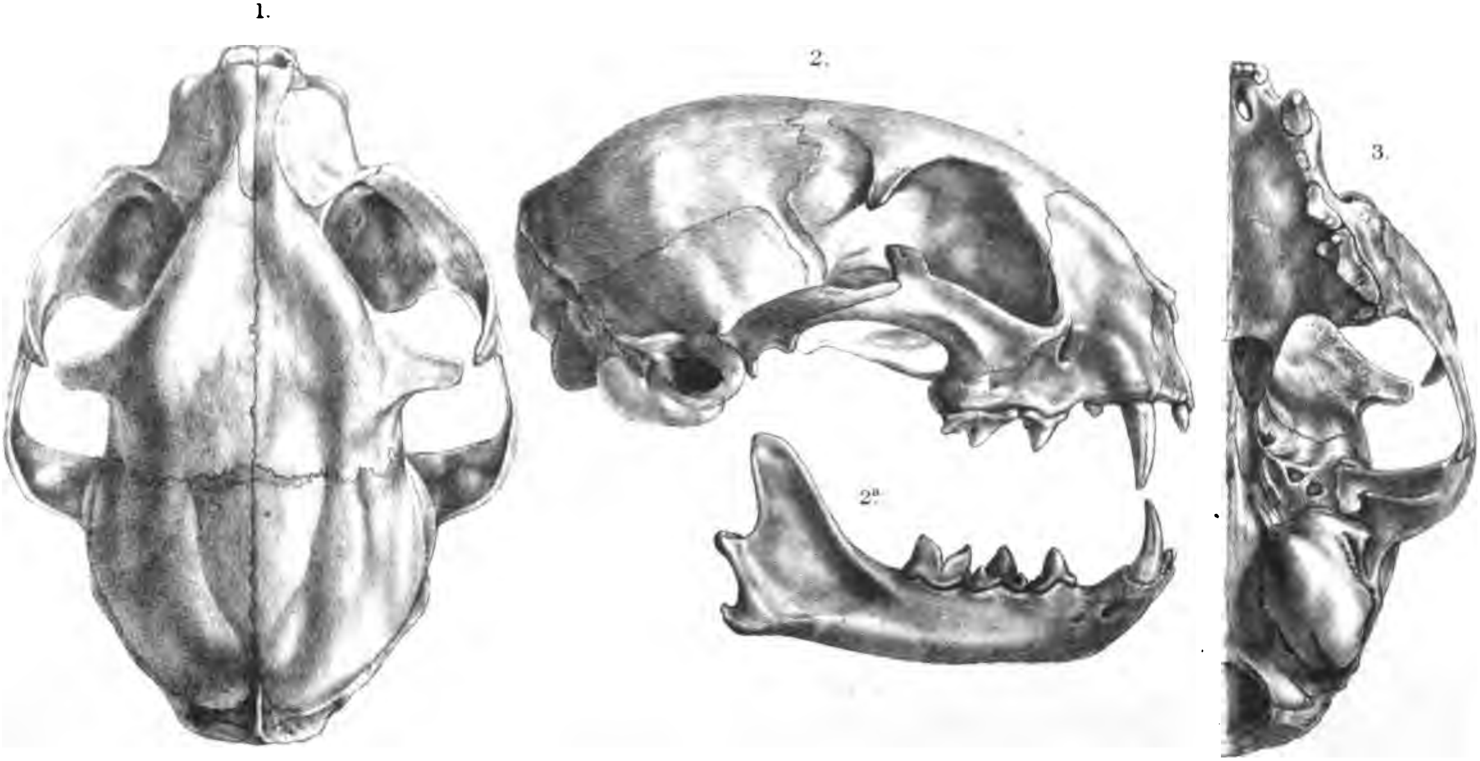
* This opening may probably represent that by which the zoœcia in the other Ctenostomata communicate with the tube from which they spring.



G H. Ford

Mintern Bros. imp.

SKULL OF CHAUS CAUDATUS.

3. On the Steppe-Cat of Bokhara (*Chaus caudatus*).

By Dr. J. E. Gray, F.R.S. &c.

[Received November 21, 1873.]

(Plates VI. & VII.)

The Zoological Department of the British Museum has lately received the skin and skull of a cat which is labelled "*Felis servalina* ♀ Cocan." On the other side of the ticket is a Russian note, which Mr. Ralston has kindly translated for me as follows:—"Bokhara Steppe-cat (with skull), near the river Dyanan, 19th November, 1857, Saliko."

Saliko is probably the name of the collector. Mr. Ralston also informs me that Daria means river; and I see by the atlas that Cocan, or Khokan, is situated on the Sir Daria; and I suppose that Dyanan is a branch of the river Sir, which falls into the sea of Aral.

Mr. Dresser has kindly lent to me an essay, in Russian, on the animals of Turkestan, which has not yet been received by the Library of the British Museum or of the Zoological Society. It is by N. A. Syevertzov, and is entitled "An Essay on the vertical and horizontal Distribution of Turkestan animals," from the Transactions of the Imperial Society of Lovers of Natural Science, Anthropology and Ethnography, vol. viii. part ii. (Moscow, 1873).

In the list of Turkestan animals, the name of *Felis servalina* occurs, and possibly it is the same as *Felis servalina* on the label of the specimen. M. Syevertzov does not describe or figure it as a new species, but prints the name as he does those of all the well-known species, not in italics as he does those which he considers new. He does not give any authority for the species; and therefore it is impossible to make out which of the cats that bear the name of *Felis servalina* he considers it to be. There are no less than three species so named in the collection of the British Museum, viz.:—

1. *Felis servalina* of Ogilby, P. Z. S. 1839, p. 4, from Sierra Leone, W. coast of Africa.
2. *Felis servalina*, Gray, P. Z. S. 1867, p. 401, from India. Now called *Felis herschelii*, Cat. Carniv. B. M. p. 28.
3. *Chaus servalinus*, Gerrard, Cat. Bones B. M. p. 65, which is a synonym of *Felis serval* of W. Africa.

But *Chaus caudatus* is undoubtedly distinct from all these.

The cat is, I believe, a species not yet inscribed in the catalogues of the genus *Chaus*. It has the close soft fur and general colouring and pencilled ears of that genus; but instead of having the short tail only reaching to the hocks or heels of the hitherto known species of that genus, its tail is elongate-cylindrical, reaching to the ground. I therefore propose to call it *Chaus caudatus*.

Chaus caudatus, n. sp. (Plate VI.)

Fur close, soft, pale yellowish, blackish brown at the base, with very numerous small irregular spots. The spots are smallest and roundest on the dorsal line, oblong on the sides, and forming interrupted lines on the shoulders and thighs, which are most distinct on the outside of the fore legs, and especially forming four broad cross streaks on the front edge of the thighs. Tail cylindrical, reaching to the ground, spotted at the upper part of the base, and with eight or nine narrow interrupted rings on the upper part of the remaining portion, and with a black tip. Nose brown, with short hair. Forehead and cheeks like the back, but with smaller spots, and without any distinct dark streaks from the back edge of the eye. The ears ovate, acute, pale brown externally, with a terminal pencil of blackish hairs, and whitish on the edge within. Chin, hinder parts of the upper lip, under part of the head, throat, chest, belly, inside of legs and hind feet whitish brown, the chin being whitest and the inside of the hind legs and feet darkest. There is a large blackish spot on the upper part of the inside of the fore legs, and two small cross streaks on the front edge of the inside of the hind thighs. The hinder part of the hind feet to the heel blackish.

Length of body and head 23½ in.; tail 12½ in.; height at shoulder 12 in.

Hab. "Cocan," Bokhara.

The skull (Pl. VII.) is 3½ in. long, and 2⅞ wide at the zygomatic arch; the lower jaw is 2⅜ in. long, and 2¼ in. wide at the condyles. It has a short face, with a round well-developed brain-cavity and large orbits.

This species is most like *Chaus ornatus*; but that differs in the spots being round and distinct and in the tail being shorter.

It differs from the *Felis chaus* from the shores of the Caspian, known all over Southern Asia as the Jungle-Cat, figured by Güldenstadt in the 'Nov. Comm. Acad. Petrop.' xx. p. 483, t. 14, in the tail being much longer and the fur distinctly spotted. The pale brown colour of the outer side of the ears at once distinguishes it from the red-eared *Chaus catolynx*, and the Cape-Cat, *Felis caligata*. It has nothing to do with the *Felis euptilura*, described and figured by Mr. Elliot in the Proc. Zool. Soc. 1873, p. 759, t. lxxvi., from a skin in a bad state belonging to Mr. Bartlett, "stated to come from Siberia," and now in the British Museum. Mr. Elliot describes his species as coming from *North-western* Siberia, and thinks it is the same as a cat from Amurland figured as *Felix undata*? by Radde (Reisen im Süden von Ost-Sibirien, 1862, p. 106, t. iv.). I do not know what is the authority for Mr. Elliot's statement as to the part of Siberia in which this animal is said to be found; Mr. Bartlett does not give any, and M. Radde travelled in *East* Siberia. Perhaps it is only a mistake in writing.

Radde collected his *Felis undata* in the Amurland; he believes (*l. c.* p. 113) that it is identical with the cat I described as *Felis chinensis*, Gray (Mag. Zool. 1837); but evidently he had never seen *Felis chinensis* from S. China, any more than he had seen *Felis undata* of Desmarest or *Felis minuta* of Temminck from Java, after which he names his cat on the plate. If he had, he must have considered them distinct unless he believed all the small Asiatic spotted cats to be of one species.

Pallas, in the 'Zoographia Russica,' vol. i. p. 29, describes the Lynxes found in the Caucasus; but they all have a short tail. The skins of the wild cat from there (p. 27) have four longitudinal black streaks on the forehead, three on the nape, and one dorsal streak.

4. On Sclater's Muntjac and other Species of the Genus *Cervulus*. By Sir Victor Brooke, Bart., F.Z.S.

[Received January 6, 1874.]

(Plates VIII. & IX.)

In a letter accompanying the specimens of *Cervulus sclateri* which are mentioned by Mr. Swinhoe in his description of that species 2 (P. Z. S. 1871, p. 813), he expresses his desire that I should describe the species more fully and exhibit the specimens to the Society. The latter part of Mr. Swinhoe's request I have great pleasure in fulfilling this evening; the former Mr. Swinhoe has rendered very difficult, his description of the species being almost as exhaustive as the materials would admit.

It has, however, occurred to me that this may be a fitting opportunity for putting together in a concise form all that is known concerning the genus *Cervulus*, so as to form a basis for future observation and research.

In the *Prox furcata* from the province of Schlesien (Steinheim), described and figured by Hensel (Zeitschr. d. deutsch. geolog. Gesellsch. 1859, xi. 251–279, T. 10, 11), we have the earliest geological occurrence of this form of Deer. The original specimens described by Hensel consisted of nearly the entire left frontal bone, with pedestal and horn complete, and of part of the superior maxillary. There is in the British Museum a cast of the former, which I have examined carefully; and the close similarity between it and a corresponding portion of the skull of *Cervulus muntjac* has astonished me, so much so that I have no hesitation in saying that, if the Miocene Muntjac's claim to specific distinction depended solely upon the characters afforded by this specimen, its claims would rest upon a very slender foundation. It cannot, however, I think, be doubted that the discovery of other parts of the skeleton of *Prox furcata* would reveal trenchant and interesting differences between this ancient form and the existing Muntjacs.

The distribution of *Cervulus*, as represented by existing species, is, with perhaps the exception of *Cervulus sclateri* (which appears to extend into the north-western Palæarctic Region), confined to and coextensive with the Indian or Middle Palæotropical Region of Sclater.

So far as the materials at my command have enabled me to form an opinion, there are but three definite and persistent modifications of this form—*Cervulus muntjac*, *Cervulus reevesi*, and *Cervulus sclateri*. Of these *Cervulus muntjac* has the most southern, *Cervulus sclateri* the most northern, and *Cervulus reevesi*, the intermediate range. This being so, analogy would lead us to look for intermediate structural characters in the species of intermediate range; but such is not the case in the present instance, *Cervulus sclateri* being intermediate in size and character to the other two species. In the three species the size of the frontal and suborbital glands increases in inverse ratio to the size of the species; hence the principal differences exhibited by their skulls, that of *Cervulus reevesi* being much more compressed from above downwards, and, if measurement be taken from the most outwardly projecting parts of the maxillæ, much wider in comparison with its length than that of either of the other species. These characters *Cervulus sclateri* exhibits in a degree intermediate between *Cervulus reevesi*, and *Cervulus muntjac*.

Mr. Swinhoe has sent home a young specimen * of *Cervulus*, which he identifies as the young of *Cervulus sclateri*; in the upper part of its back and sides it is dappled with distinct yellowish spots, this specimen is stuffed in the British Museum (1620 c, Gray, Hand-list, p. 165). In the British Museum there is also a specimen of a very young *Cervulus reevesi*, said to have been sent from Amoy by Mr. Swinhoe (1524 d, *l.c.* p. 165): this specimen shows no sign of spots, the fur being annulated as in the adult. The young of *Cervulus muntjac* is spotted; it would therefore appear that, in the fact of having the young spotted, *Cervulus muntjac* and *Cervulus sclateri* agree together and differ from *Cervulus reevesi*. I must, however, confess that, until an opportunity offers of examining a larger series of the young of all three species, this can hardly be considered satisfactorily established. The skin of a very young specimen of *Cervulus sclateri* sent home by Mr. Swinhoe, the skull of which shows only the first true molar in place, being spotless, leads me to believe that these markings in the Muntjacs are lost at a very early age; it is therefore not *impossible* that the spotless stuffed specimen of *Cervulus reevesi* in the British Museum may represent that species at an age when the spots are lost.

Correlated, apparently, with the long persistence of this form, I find in the reduction of the number of parts remaining permanently separate in the tarsal joint a more advanced stage of specialization than that exhibited by any Artiodactyle, with the exception of two probably equally ancient forms—namely, the simple horned *Cervus pudu* of Chili, and *Hyomoschus aquaticus*. In the typical tarsus of the Pecora, specialization has proceeded two steps in advance of that shown in the Suinæ; the navicular and cuboid have become united into one bone, as have also the second and third cuneiforms †, the first cuneiform being represented by a small separate bone. Thus the typical adult tarsus of the Pecora (fig. 1 *c*) presents five separate

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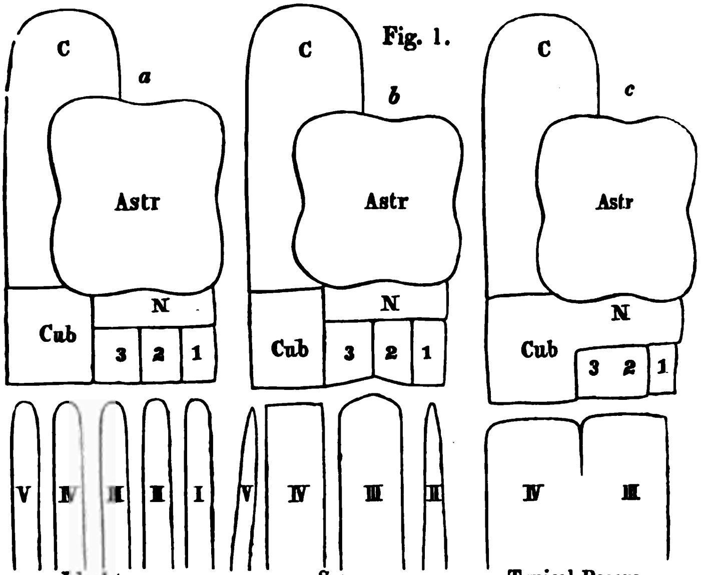
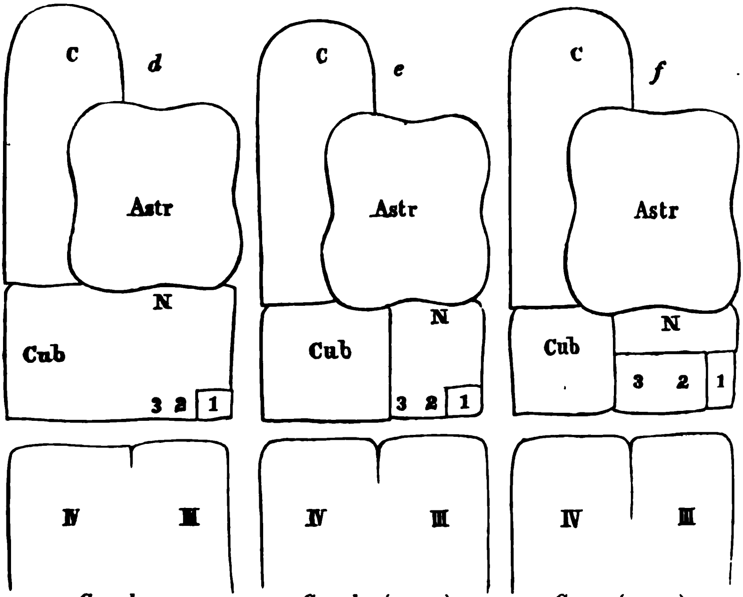
* See P. Z. S. 1872, p. 813.

† Professor Flower informs me that Dr. Kowalevsky has shown him convincing proof that the large bone between the cuboid and internal cuneiform in the Pecora represents the second and third cuneiform united.

Fig. 1.



Ideal type. *Sus.* Typical Pecora.



Cervulus. *Cervulus* (young). *Cervus* (young).

Diagram showing the condition of the tarsus in *Cervulus* as compared with the typical Mammalian tarsus and that of *Sus* and the ordinary Pecora.

C, calcaneum; Astr, astragalus; Cub, cuboides; N, naviculare; 1, 2, 3, cuneiformia; I, II, III, IV, V, metatarsals.

bones—the astragalus (Astr), the confluent navicular and cuboid bone (N & Cub), that of the second and third cuneiform (3, 2), and the first cuneiform (1). In the adult tarsus of *Cervulus* (fig. 1 *d*), in several specimens which I have examined, there are but four separate bones; these bones are the calcaneum, the astragalus, and then a large nearly square bone (fig, 1 *d*, Cub, N, 3, 2) with a small space cut out of its interno-posterior surface for the reception of a very small bone (fig. 1 *d*, 1), which appears, from its relation to the surrounding parts, unquestionably to represent the first cuneiform. Nor can there, I think, be much doubt that the large square bone of the tarsus of *Cervulus* represents the naviculo-cuboid bone of the ordinary Pecora, plus the confluent second and third cuneiforms. The order of the successive steps of the anchylosis of these separate parts appears to me of considerable interest; I find in the skeleton of the very young specimen of *Cervulus sclateri* above mentioned (fig. 1 *e*), that the distal row of the tarsus consists of two nearly equal-sized bones (Cub & N, 2, 3), and the very small first cuneiform (1). Anchylosis appears to be just commencing between the two larger bones. In the skeleton of a Fallow Deer of similar age (fig. 1 *f*) the navicular and cuboid present a condition similar to that exhibited by these two large bones in the tarsus of *Cervulus*. It would therefore appear that the unusual condition of the anchylosis of the navicular and confluent second and third cuneiforms obtains in *Cervulus* at an earlier age than the ordinary condition, amongst the Cervidæ, of the confluence of the navicular and cuboid bones. An interesting question naturally follows, and one which palæontology will doubtless one day answer. Is the history of the tarsus of the individual an epitome of that of the entire form? If so, *Cervulus* and *Cervus* will be found segregated far into the geological past; and in considering the genealogy of the latter, no species need be taken into consideration that exhibits the cervuline tarsus—the converse obtaining with equal force, no species presenting a cervine tarsus being likely to have held a place in the pedigree of *Cervulus*.

The tarsus of *Cervus pudu* resembles that of *Cervulus*. In *Hyomoschus* the second and third cuneiforms are either suppressed or anchylosed to the proximal end of the third metatarsal.

In the Cervidæ the reduction of the second and fifth metacarpals appears to have followed two distinct paths. In one the reduction takes place from above downwards, the proximal ends of these bones disappearing, the distal ends remaining articulated by synovial joints with their respective phalanges (fig. 2 *a*). Following this method I have observed *Alces, Rangifer, Moschus, Hydropotes, Cervus capreolus, Coassus, Cariacus*, and *Cervus pudu*. In the other, reduction appears to have crept from below upwards, the proximal ends of the bones remaining separated consequently from their phalangeal extremities (fig. 2 *b*). Following this second method are *Rusa, Hyelaphus, Cervus dama, Cervus magaceros, Cervus elaphus* and its allies, *Elaphurus davidianus*, and *Cervulus*. *Cervulus*, however, in this respect (see fig. 2, *c*), as well as in the condition of the tarsus, shows an advance in specialization, all the phalanges of

Fig. 2.

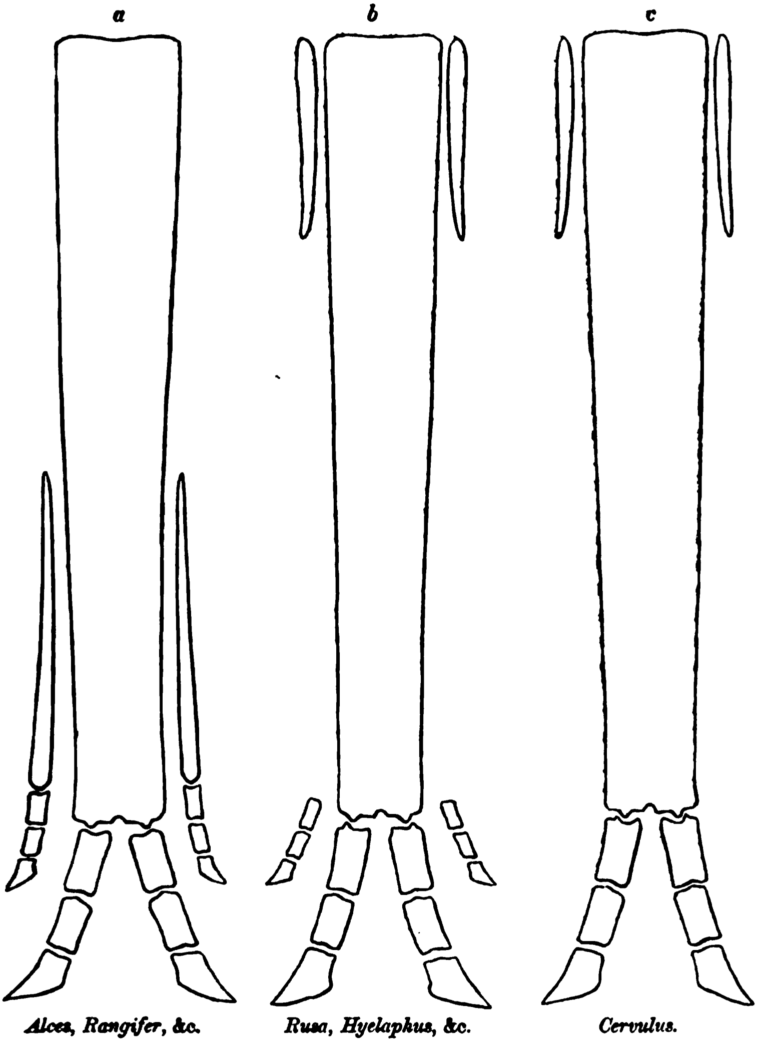


Diagram showing the two paths followed by the *Cervidæ* in the reduction of the second and fifth metacarpals, and the loss of the phalangeal extremities of these digits in *Cervulus*.

the fourth and fifth digits on both fore and hind extremities having, as far at least as the specimens examined by me are concerned, entirely disappeared. In this respect *Cervulus* stands alone amongst the Cervidæ.

The Muntjacs are small animals, solitary in habits, rarely even two being seen together. They are fond of hilly grounds covered with forest, and, in common with all deer, exhibit much partiality to particular spots. Their alarm-cry is a sharp shrill bark; when attacked by dogs the males use their sharp exserted canines with extraordinary severity, inflicting upon their opponents deep and, at times, even dangerous wounds. These teeth being very loose in their sockets, it has been imagined by some that the animal possesses the power of moving them, so as to give greater effect to the blow when striking with them. I have never examined the matter for myself; but the presence or absence of muscular fibre connected with the canines would at once decide the question. Mr. Swinhoe (P. Z. S. 1872, p. 816) describes a similar looseness in the canines of *Hydropotes inermis*.

Genus CERVULUS.

1816. *Cervulus*, Blainville, Bull. Soc. Phil. p. 74.

1827. *Styloceros* (subgenus), Ham. Smith, Griff. Cuv. An. Kingd. vol. v. p. 319.

1836. *Prox*, Ogilby, P. Z. S. p. 135.

Stature small. Hair smooth and short. Cutaneous frontal glands present. Suborbital glands large. No tarsal glands. Limbs short. Back arched, high behind. Frontals developing, in the male, long processes for the support of the horns, each process sending downwards from its root a supraorbital ridge, which serves to protect the frontal glands. Horns short, possessing short brow-antlers, which, as well as the points of the horns themselves, project inwards.

CERVULUS MUNTJAC.

1780. *Cervus muntjak*, Zimm. Geogr. Gesch. Band ii. p. 131.

1781. *Rib-faced Deer*, Penn. Hist. Quadr. sec. edit. p. 107.

1785. *Cervus muntjak* and *C. vaginalis*, Bodd. Elench. anim. vol. i. p. 136.

1788. *Cervus muntjac*, Gm. S. N. i. p. 180.

1811. *Kijang*, Marsd. Hist. Sum. 3rd. edit. p. 117, cum fig.

1816. *Cervus moschatus*, Blainv. Nouv. Bull. Soc. Phil. p. 77.

1824. *Cervus muntjac*, Horsf. Zool. Res. Java.

1839–1844. *Cervus muntjac*, Müll. & Schl. Verh. Nat. Gesch. p. 225.

1827. *Cervus muntjak* and *C. moschatus*, Ham. Smith, Griff. edit. Cuv. Anim. Kingd. vol. v. pp. 319, 320.

1852. *Styloceros muntjacus*, Kelaart, Prodr. Faun. Zeyl. p. 85.

1855. *Cervus muntjac* and *C. styloceros*, Wagn. Säugeth. p. 388.

1867. *Cervulus aureus*, Jerd. Mamm. p. 264.

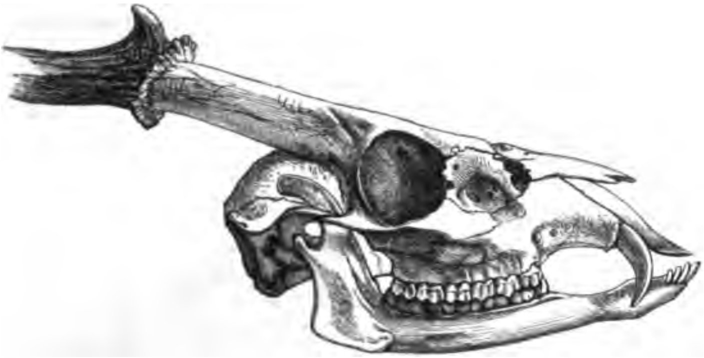
1869. *Cervulus vaginalis*, Swinhoe, P. Z. S. p. 652.

1873. *Cervulus moschatus*, Gray, Hand-list Rum. Mamm. p. 163.

1873. *Cervulus amostylis*, Gray, *ibid.* p. 165.
1873. *Cervulus tamulicus*, Gray, *ibid.*

Anterior parts of the face, from the muzzle to between the eyes, brown, a blackish line running up the inside of each frontal pedestal. The rest of the pedestals, upper parts of the forehead, and occiput foxy red. Fore legs, from the shoulder downwards, line in front of the hind legs, starting from the patella, and all the limbs from the tarsal joints downwards, dark bluish brown. Chin, throat, inside of hind legs and under surface of tail white. The rest of the body of a brilliant yellowish red, darker in the upper parts of the back—the hairs on the sides being grey below, strongly tipped with yellow, those on the back being also ringed with black.

Fig. 3.



Skull of *Cervulus muntjac*.

Skull. Depression in the lachrymal bone for the reception of the suborbital gland not occupying the entire bone, a portion of the lachrymal falling in a vertical direction between the frontal bone, the anteorbital vacuity, and the gland.

Height about 26″ at the shoulder.

Hab. British India, Burmah, Malay peninsula, Sumatra, Java, Hainan; Banka, Borneo (*Schl. & Müll.*).

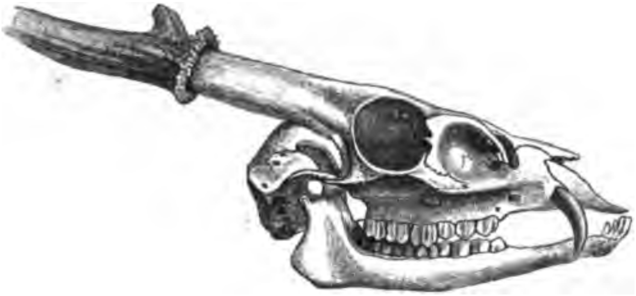
In a large collection of the skins, skulls, and horns of this species, which I have received from all parts of India and Burmah, and in a considerable number of living specimens which I have examined, I have observed amongst adult animals so much difference in size and intensity of coloration, that I have found it impossible to retain the Muntjac of Java and Sumatra as a distinct species. The Muntjacs from the south of India are, as a rule, decidedly smaller than those from the north, as is also the case with the Axis and Indian Antelope. But even this rule is subject to many exceptions; I have received from Northern India perfectly adult and even slightly aged specimens of both Muntjac and Axis inferior in size to the average as presented by these species in Southern India. These small races are always connected with particular areas, and are doubtless the result of conditions sufficiently unfavourable to prevent the species reaching the full luxuriance of growth and beauty of which it is capable, though not sufficiently rigorous to prevent its existence.

CERVULUS SCLATERI. (Plate VIII.)

1873. *Cervulus sclateri*, Swinhoe, P. Z. S. p. 813.

♂ *adult.* The entire forehead, occiput, and outside of ear-conchs yellow. The intensity of the yellow varies in different specimens, but is always sufficiently strong to form a very conspicuous character in the appearance of the males of this species. A line running up the inside of the horn-pedestals, starting from the frontal glands, jet-black, this marking contrasting strongly with the yellow of the forehead. Cheeks, anterior of neck and throat, belly, and upper surface of tail foxy red. Chin, a line running down the anterior of the tibial portion of the hind limbs, and under surface of tail white. The rest of the body bluish brown speckled with red.

Fig. 4.



Skull of *Cervulus sclateri.*

Skull. Depression in lachrymal for suborbital gland occupying nearly the entire bone. Nasals more prolonged backwards than in the other species. Parts anterior to the orbits also more prolonged and tapering gradually from the orbits to the præmaxillæ.

Height 19″ at the shoulder.

Hab. "Abounding in the hills to the back of Hangchow city" (*Swinhoe*).

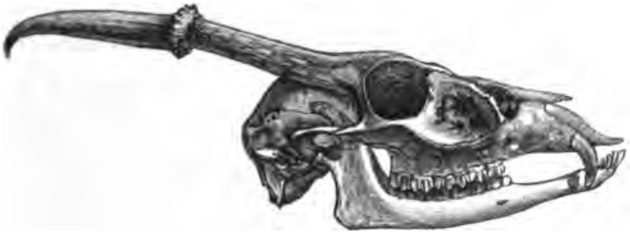
Mr. Swinhoe says, "the female of this species may easily be confounded with the female of *C. reevesi*; but the brighter colour of the latter, and her pure white chin and throat will serve as distinguishing characters for the skin." He describes *C. sclateri* as more porcine in appearance than *C. reevesi*. I am astonished at this, as it is hard to imagine a Deer more pig-like, or, rather, more peccary-like in shape and gestures than *C. reevesi*. The form of the skulls of the two species would lead me to expect the more high-bred and refined appearance in the new species.

CERVULUS REEVESI. (Plate IX.)

1838. *Cervus reevesi*, Ogilby, P. Z. S. p. 105.
1862. *Cervulus reevesi*, Swinhoe, P. Z. S. p. 361.
1870. *Cervulus reevesi*, Swinhoe, P. Z. S. p. 644.
1873. *Cervulus reevesi*, Gray, Hand-list Rum. Mamm. p. 165.

Anterior parts of the face below the eyes brown; between the eyes the hair becomes more scanty, strong black lines running from each frontal gland up the inside of the horn-pedestals. Upper parts of the forehead become gradually rufous from the mixture of red hairs, the rufous becoming more intense on the occiput and ending in a strongly defined line between the ears. Posterior of neck, back, and sides grizzly rufous, a line running down the centre of the neck and back and forearms bluish brown. Cheeks, throat, belly, and upper surface of tail rufous. Chin and under surface of tail white. Fawn without spots.

Fig. 5.



Skull of *Cervulus reevesi.*

Skull. Depression for the reception of the suborbital gland, of immense size, modifying all the surrounding bones, and giving the parts of the skull anterior to the orbits a compressed appearance from above downwards, the floor of the suborbital fossa being much flattened and pulled out laterally. The pedestals of the frontal bones, in all the specimens examined by me, much more parallel than in the two other species. Frontal supraorbital ridges very strongly developed. Parts anterior to the suborbital gland compressed from side to side and very short,

Height scarcely 13" at the shoulder.

Hab. Southern China, from the latitude of Canton, as far north as Ningpo; Formosa.

Females hornless. Canines in the males long, pulp-cavity non-persistent. Suborbital fossa deep, anteorbital vacuity small. Tarsus with the navicular, cuboid, external, and middle cuneiform bones united. Phalanges of second and fifth metacarpals and metatarsals absent.

The figure (Plate IX.) is taken from a specimen living in the Society's Gardens since August 1867. See Rev. Cat. Vert. p. 109.

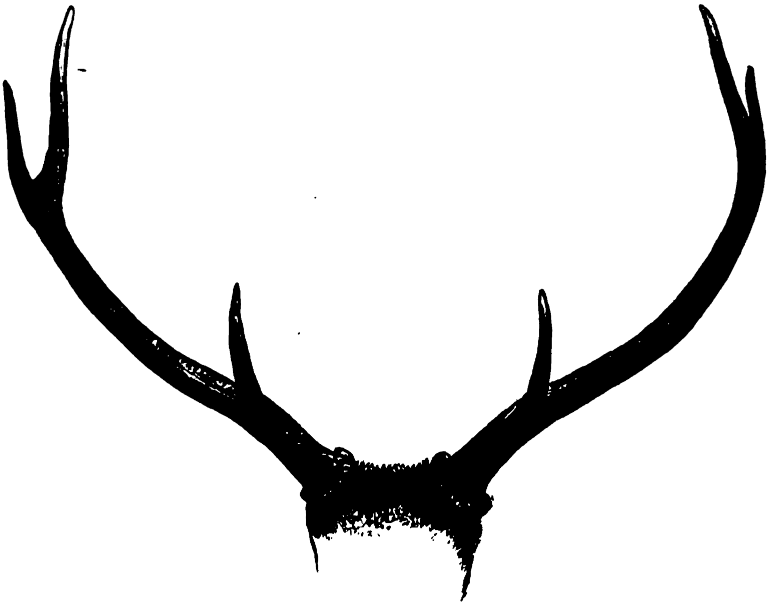
P.S. (Feb. 27).—Since reading this paper I have seen the type of *Cervulus lacrymans*, figured and described by M. Alphonse Milne-Edwards in his 'Recherches pour servir à l'Histoire Naturelle des

Mamm.' (pl. 64), and am nearly convinced that this specimen, which was obtained in Moupin by Père David, is of the same species as *Cervulus sclateri*. If this be so, the former name being the older, must be retained. I may also mention that M. A. Milne-Edwards informs me that, out of a very large number of *Cervulus muntjac* born in the Jardin des Plantes, he has never seen the young spotted; and several specimens preserved in the Museum are without any sign of spots. On the other hand, a very large young Muntjac, obtained in Sumatra, is distinctly spotted. If it were not that there exists in the British Museum a young spotted Muntjac (Hand-list, p. 163, 701 *i*), sent by Mr. Hodgson from Nepal, I should be inclined to think that after all the *Cervuli* of India, and of Sumatra and Java, may be specifically distinct. The matter requires more investigation, based upon a large number of fresh specimens.

5. On a new Species of Deer from Persia. By Sir Victor Brooke, Bart., F.Z.S.

[Received January 6, 1874.]

Amongst a large number of very interesting specimens of natural history received a short time ago from Major Jones, H. B. M. Consul at Tabreez, in Persia, are the frontlet and horns of a deer, which appear to me of great interest, representing as they do, not



Horns of *Cervus caspicus*.

only a new species, but a type which I should have least expected to find occurring in Persia. It will be seen that these horns, which I have the pleasure of exhibiting this evening, belong to a member of the Rusine section of the Cervidæ, and on the whole resemble more nearly those of the Axis than those of any other species. The small amount of hair which remains below the burrs is also of the same colour as that found surrounding the pedestals of the Indian Axis. As far, however, as it is possible to judge from such a small fragment of the skull, the new Persian deer is decidedly larger than the Axis, and the horns present characters which, taken in connexion with the locality from which they were obtained, lead me to believe that they represent a well-defined and unknown species. In the Axis the outermost of the two upper tines is always, in normal specimens, the longest. In the new species the corresponding tine is the shortest, as obtains in all normal specimens of the *Cervus hippelaphus* of Java. In *Cervus aristotelis*, on the contrary, no character of distinction is afforded by the relative length of these upper tines; and, as far as it is possible to judge from a single specimen, I think it not at all improbable that this will be found to be the case with this Persian species. In their general texture, in their superior massiveness in comparison with their length, in their wide set, and in a quantity of small details which are very striking to the eye, but appear trivial upon paper, these horns differ from those belonging to any species with which I am acquainted. I therefore propose provisionally to confer upon this species the name of *Cervus caspicus*, the specimen having been procured from the district of Talisch, on the south-west coast of the Caspian Sea.

The horns possess strong brow-antlers rising immediately above the burrs, a long massive beam, and two upper points, the outer of which is the shortest.

Their measurements are as follows:—

Length round the outside curve	26″
Length of brow-antlers	8½″
Largest span from horn to horn	30″
Circumference of beam	4½″

6. Descriptions of Ten new Birds from the Nágá Hills and Munipúr Valley, N.E. Frontier of Bengal. By Major H. H. Godwin-Austen, F.R.G.S., F.Z.S., &c.

[Received January 5, 1874.]

(Plates X., XI. & XII.)

The new birds from which the following descriptions have been drawn up were obtained by me during the field-season of 1872–73, while employed in charge of the Boundary Survey operations along the main watershed of the Brahmaputra and Irrawaddy rivers.

In presenting this paper I must not omit to acknowledge the very cordial and able assistance that has been given me by Viscount

Walden, and the great use his fine collection has proved in the correct determination of so many of the birds I obtained.

Several birds from the same part of India yet remain to be identified; and I may mention the discovery of a *Bambusicola*, allied to *B. fytchii*, Anderson, with which my specimen agrees very closely, but the dimensions differ much. Thus:—

	Length. in.	Wing. in.	Tail. in.	Tarsus. in.	Bill at front. in.
Yunan bird	12·0	5·8	4·2	1·58	0·86
Khasi bird	14·5	6·25	5·0	1·2	0·90

If this should prove distinct on comparison of the specimens, I propose to name it *B. hopkinsoni*, after the able officer so long the Commissioner of Assam, and who took so great an interest in our survey operations.

The presence of this bird so far west, even if it should prove identical with Anderson's bird, is a point of very great interest in the distribution of some of the forms from Western China.

Cypselus subfurcatus, Blyth, identical with specimens from Amoy and Malacca, I also found breeding at Shillong in June, in the precipices that bound the Umiam valley—*Cypselus infumatus*, Sclater (*tectorum* of Jerdon), being another Swift having an equally extended range and discovered about the same time; and the presence of other genera on this elevated promontory of the Gáro, Khási, and Nágá Hills, south of the alluvial valley of the Brahmaputra, marks most distinctly the extreme limit of the very marked Indo-Chinese and Malayan fauna, across which narrow belt many do not extend.

SITTA NAGAENSIS, n. sp.

Description.—Above slaty blue, palest on neck and head; two centre tail-feathers, shoulder of wing, and secondaries same colour rather brighter; quills brown-black; outer tail-feathers black, with a white patch on the inner web of the four outer, increasing outwards and in the outermost extending diagonally to the other web, all tipped grey and terminating in black; a black streak from lores through eye to ear-coverts and down side of neck. Beneath dull sordid white, purer on chin and throat, with a few white feathers bounding the ear-coverts; flanks, thighs, and under tail-coverts rusty chestnut, all the latter with a terminal white spot.

Bill black above, grey below; legs greenish black; irides dark brown.

Length 4·9 inches, wing 3·0, tail 1·75, tarsus 0·68, bill at front 0·58, extent of foot 1·2.

Inhabits the Nágá Hill-ranges, and was not uncommon.

GARRULAX GALBANUS, n. sp. (Plate X.)

Description.—Above pale pure olivaceous on head, with a brown tinge on the back; tail pale ashy brown; the four central feathers tipped umber-brown and barred; the four outer of the same colour in middle and broadly tipped with white; wing concolorous with back; quills pale umber-brown, edged grey. Very narrow frontal band; base of lower mandible, lores through eyes and ear-coverts rich black; beneath dull yellow, purer on the throat, passing into olivaceous on the flanks; under tail-coverts white.

Bill black; legs ash-grey; irides red brown.

Length 9 inches, wing 3·65, tail 4·1, tarsus 1·35, bill at front 0·8.

I first obtained this very handsome bird in the Munipúr valley, under the Koupru range, in February 1873. It associates in large flocks of from fifty to eighty or more, very noisy, following each other in a long string through the high grass, which they seem to frequent and prefer to the denser forest. When on the flight their white tail-feathers and under tail-coverts of the same colour make them very conspicuous. I observed it also on the head-waters of the Barak and other streams that flow into the Munipúr valley on the north-east. The nearest allied species is *G. gularis*, M'Clelland, which is also yellow on breast; but is dark slate-grey above, with rufous on upper tail-coverts, flanks, abdomen, and vent.

GARRULAX ALBO-SUPERCILIARIS, n. sp.

Description.—Above, head and forehead reddish umber-brown, paling on back of neck into dull olivaceous brown on the rump and whole of the wing; tail pale red-brown; lores, a patch below eye, under ear-coverts, and supercilium, which extends backwards for 1·5 inch from the lores, white; upper portion of ear-coverts dark brown; chin and throat ruddy brown, paling on the breast into very pale dingy olivaceous, and into pale earthy ochre on abdomen and flanks; under tail-coverts rufous.

Bill black; legs fleshy brown; irides dull red.

Length 9 inches, wing 3·8, tail 4·2, tarsus 1·38, bill at front 0·7.

One specimen obtained in the Munipúr valley, near Kaibi.

This dull-coloured *Garrulax* is very similar in coloration to *G. rufifrons*, Sw., of Java, which is a larger bird, and has no white superciliaries or lower ear-coverts. Another similar form is *G. cinereifrons*, Blyth, from Ceylon.

TROCHALOPTERON CINERACEUM, n. sp. (Plate XI.)

Description.—Above pale ashy olivaceous, greyer on the tail, which is black for 0·7″ at the terminal end, then tipped broadly white. Wing: quills pale black, edged hoary grey; the secondaries tipped black, and their square tips edged white, in keeping with the tail. Primary coverts near the bastard wing black, forming a wing-spot. Top of head black, extending in a narrow line down back of neck; lores and a broad band over eyes and ear-coverts dingy white; a few pure white feathers below eyes merging into ear-coverts; a narrow black line extends from posterior corner of eye over the ear-coverts, and a moustachial streak of the same colour merges into indistinct spots. Chin white, with a few hairy black streaks; breast and underparts sullied white, with a slight vinous tinge on the former, and a dash of ruddy rufous on side of neck; ochraceous on belly and under tail-coverts.

Bill pale yellow shaded dark above; legs fleshy brown; irides pale ruddy ochre.

Length 8·75 inches, wing 3·22, tail 4·0, tarsus 1·25, bill at front 0·68.

In general coloration this bird approaches *T. variegatum*, Vigors. Its yellow bill and much smaller weaker legs and feet make it a very marked form of this genus.

TROCHALOPTERON VIRGATUM, n. sp.

Description.—Head dark rufous brown, olivaceous on back, paler and greyer on rump; tail olive-brown, with a slight tinge of rusty on basal half, finely and indistinctly barred; wing, first three quills grey on outer web, the rest and secondaries pale ferruginous merging into rich chestnut at their base; coverts of the latter colour, narrowly tipped ochre; feathers of winglet conspicuously white-centred, and lores chestnut, a white supercilium; ear-coverts pale rusty; chin and throat rich dark chestnut; breast and abdomen bright ochraceous; under tail-coverts darker brown. As viewed from below, the tail is grey brown, each feather faintly tipped with white.

All the feathers of the head, upper back, flanks, and breast are centred white or pale ochre; and those of the head and neck are rigid.

Bill black; legs pinky grey; irides pale brown.

Length 9 inches, wing 3·5, tail 4·85, tarsus 1·3, bill at front 0·6.

Obtained a single specimen near the village of Rázámi, Nágá Hills, under the Kopamedza ridge, 5000 feet.

This strikingly plumaged species is very close to *T. setiferum*, Hodgs., with which I compared it; but differs very materially. *T. lineatum*, Vigors, is another allied form.

ACTINODURA WALDENI, n. sp. (Plate XII.)

Description.—Head full-crested, extending back for more than an inch, hoary grey, edged pale; back rich brown with a greenish hue, becoming more rufous on the rump and upper tail-coverts; base of tail-feathers chestnut, for half their length narrowly barred with black, then black for terminal inch, the three outer tipped white; quills black, outer web chestnut at base, then barred with black, and the narrow terminal portion grey; primary coverts black, the winglet-feathers grey, barred black; ear-coverts hoary; side of head hair grey; chin, breast, and abdomen rufous brown, paler on chin and throat, the whole having a streaky appearance, the feathers being centred with a darker shade.

Bill grey; legs and feet fleshy brown; irides pale grey.

Length 8 inches, wing 3·48, tail 3·45, tarsus 1·2, bill at front 0·62.

I first shot this bird on the Peak of Japvo, at about 9000 feet, on the Burrail range, Nágá Hills.

This is a small form of *A. egertoni*, which occurs in the same locality, every character being repeated in the two forms, yet each distinct; no better example of a gradual change in size and coloration could be shown.

MALACOCERCUS (LAYARDIA) RUBIGINOSUS, n. sp.

Description.—Above rich rusty brown, darker on the head, with black shafts to feathers; wings and tail of same colour, the latter distinctly barred; lores white, beneath pale rufescent, nearly white under chin, and pale on centre of abdomen.

Bill black, well curved; legs pale corneous or dull grey brown; irides nearly white.

Length 9·5 inches, wing 3·0, tail 4·8, tarsus 1·16, bill at front 0·62.

I first shot this bird in long grass near the Logtak Lake, Munipúr, and again obtained specimens near Kaibi in the same valley. It is essentially a grass-bird, with all the habits of *M. terricolor*, Hodgson. They associate about a dozen together, flying through the grass one after the other in a scattered line, never abiding long in one place.

By the kind assistance of R. B. Sharpe, Esq., of the British Museum, I have been able to examine a near ally of this bird marked *Malacocercus subrufus*, from Malabar, which is not so intensely rufous, has no white on the throat, is greyish on the head, and has a yellow lower mandible.

PRINIA RUFULA, n. sp.

Description.—Above, the head ashy brown, becoming more russet on back and pale rufous on rump and upper tail-coverts; tail brown, indistinctly barred, tipped white on the outer tail-feathers, with a subterminal dark spot; wing dark brown, with pale rusty brown edgings to primaries and secondaries; lores, round eye and ear-coverts pale ashy; below chin sullied white, greyer white on breast; ochraceous on abdomen; flanks and thighs pale brown.

Bill black, both above and below; legs pale corneous, with darker claws; irides ruddy ochre.

Length 4·75 inches, wing 1·82, tail 2·4, tarsus 0·75, bill at front 0·4.

This species was common in the Nágá Hills and Munipúr, and replaces *P. hodgsoni*, Blyth, on the Khási-Hills side. It is quite distinct from *P. gracilis*, which has a marked rufous forehead, and can be distinguished at a glance from the former bird, which is remarkably ashy, with dark ear-coverts.

CISTICOLA MUNIPURENSIS, n. sp.

Description.—Above dark umber-brown, feathers margined pale ochre on head, broader and more rufous on back; upper tail-coverts plain rufous brown; the feathers on nape are paler rufous and dark shafting subdued; tail dark umber, the two centre feathers margined rufous brown, viewed from below tipped whitish, with subterminal dark spots; white on chin, throat, and centre of abdomen rufescent on breast and flanks. Pale round eye.

Bill black above, pale beneath; legs fleshy brown.

Length 4·25 inches, wing 2·0, tail 1·65, tarsus 0·76, bill at front 0·40.

I obtained four specimens of this species in the reedy sides of the Logtak Lake, Munipúr valley. It differs on comparison with *C. schœnicola*, Bonap., and *C. ruficollis*, Walden, which I also obtained, and is intermediate in coloration, and may be known at once by the dark edging along the shafts of the centre tail-feathers, which in *C. ruficollis* are wholly dark, and in *C. schœnicola* are banded broadly rufous, terminating black and white. It is very near to *C. rustica*, Wallace, from the Island of Bouru, which is more rufous on the head and breast.

Munia subundulata, n. sp.

Description.—♂ above pale umber-brown, darker on the head, pale grey on rump, a few feathers edged paler; the upper tail-coverts dull yellow; tail-feathers olivaceous umber-brown, faintly edged with the same yellow tint; quills pale chestnut on outer web, umber-brown on inner, and indistinctly barred. Sides of head umber-brown, becoming dark chestnut on chin and throat; breast and flanks white, feathers very narrowly barred or margined rufous-brown; abdomen and under tail-coverts dull white, the latter sparingly streaked with brown; feathers of the back finely pale-shafted.

Bill dark grey; feet plumbeous; irides red.

Length 4·3 inches, wing 2·1, tail 1·7, tarsus ·55, bill at front 0·45.

♀ is duller brown above, with no white shafts to the feathers, a distinct green tinge upon the tail-feathers, otherwise as in *M. undulata*. Change of coloration in young males commences on centre of the throat, extending towards the base of bill into the dark chestnut, and towards breast into the undulated colouring of those parts.

Obtained in the Munipúr valley both on Lake Logtak and the head of the Barak river. It is very nearly allied to, but distinct from *M. undulata*, Latham, in which the undulations are broad, the general coloration more rufous, and the tail more pointed. It is also near to *M. nisoria* from Java and Malacca; but in that bird the tail-coverts are grey, with no trace of the fulvescent common to the two continental forms. Lord Walden was the first to notice this species as distinct, in specimens from Burmah, in his collection, which are identical with my own from Munipúr: he has kindly allowed me to now describe it.

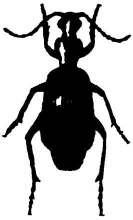
7. On the Coleoptera Geodephaga of Chile.

By Edwyn C. Reed, C.M.Z.S.

[Received January 6, 1874.]

(Plate XIII.)

In this attempt to enumerate the Chilian species of the Coleopterous families Cicindelidæ and Carabidæ the first difficulty is to define the area under consideration. The governments of Chili, Bolivia, and the Argentine Confederation have been trying for some years past to settle the question of the boundaries of their respective States. Chili claims dominion over the strip of country between the Andes (*i. e.* the line of water-parting) and the Pacific, from 24° S. to Cape



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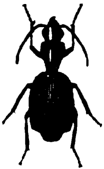

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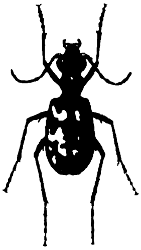

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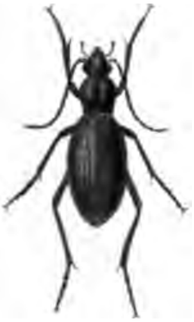

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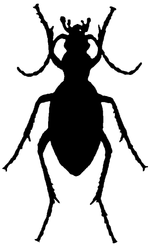

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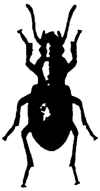

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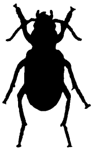

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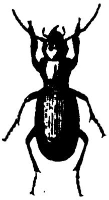

8.

A. T. Hollick.

Mintern Bros imp.

NEW CHILIAN COLEOPTERA.

Horn, and has, as far as I can see, every right to it; but it seems that in Patagonia the Andes disappear, and there is therefore no definite boundary. Again, on the north, Dr. Philippi found during his journey in the desert of Atacama that the great South-American backbone was utterly dislocated there; and in place of a continuous chain with a well defined water-parting, he found a plateau of considerable height and isolated mountain cones; and as no rain falls just there, the dividing line cannot be found.

One zoological region, however, which I may call Chili Proper, is very well defined,—the desert of Atacama, in which a dozen species of Coleoptera have not yet been found, being the northern boundary (24° S.), the archipelago of Chonos (about 45° S.) the southern, the Pacific the western, and the snowy Andes the eastern.

The interruption of the Andean chain in Atacama has no importance with regard to the insect fauna, as no species appears to be able to cross that arid region.

We have therefore to deal with a long narrow strip of land, extending twenty-one degrees from north to south, with a width of but two and a half degrees in its widest part, and presenting more climatic peculiarities than, probably, any other part of the world of equal extent.

In addition to the Andes, a coast-range runs through Chili from north to south, with many peaks from 4000 to 5000 feet in height. Between the Andes and the coast-range lies the "central plain" of Chili, with a height above the sea of 1800 feet at Santiago, thence southwards sloping down to the sea-level at Port Montt, and rising northwards to form the high tablelands of Atacama and Bolivia.

With regard to climate, most travellers agree that it rains sometimes in the desert of Atacama; but a difference of opinion exists about the amount; some state that it rains there nearly every year, while Dr. Philippi states that it probably has but few showers in a century.

About Valdivia, on the other hand, little difference of opinion can exist, as a week of dry weather is an exception to the rule. About one hundred and twenty inches may be taken as the average yearly rainfall of Valdivia.

This abundant rainfall in the south naturally produces a varied and rich flora; but, strange to say, Chili is far from rich in insects, either in species or individuals. About four thousand species of vascular plants are recorded, while the Coleoptera scarcely pass two thousand species; and many of these appear to be very rare.

Gay, the author of the 'Historia Fisica y Politica de Chile,' after collecting assiduously for many years, described only about 1500 species of insects of all orders; and in this number he included all previous descriptions that he was acquainted with, and introduced many insects erroneously into the Chilian Fauna.

On my arrival in Chili, in 1866, some 3000 species of all orders were known; and even now they scarcely reach 4000, and new species are not as easily obtained as formerly.

Owing to the gradual transition of climate in Chili it is difficult to divide the country into districts or "centres;" but if this latter word may be used in a limited sense, and applied to parts where a number of species are most common and whence they become fewer on all sides, then we may define three "centres" or districts in Chili. These I have already pointed out, in a communication to the Bristol Naturalists' Society on the Botany of Chili (November, 1873).

"Northern Chili" extends from Atacama to Coquimbo, and is little else than the southern border of Atacama. Its characteristic Coleoptera are a few genera of Tenebrionidæ, such as *Callyntra* and allies. *Cicindela peruviana* is peculiar to this district. I have never collected there myself; but from small collections that I have received from Mr. Thomas King and others, I consider it to be very poor in species.

Gay, in his work above alluded to, appears to have taken a large number of species there; but both Dr. Philippi and myself are convinced that the greater part of these are not correctly referred to that locality.

"Central Chili" may extend from Coquimbo to Arauco (36° S.). It is most rich and varied botanically; and near the celebrated baths of Chillan more species of animals and plants occur than probably at any other place in Chili; here too we find the northern limit of the genus *Carabus* in Chili; *C. chilensis* and *Cicindela chilensis* are peculiar to this district. Near Chillan and to the south dense forests occur. The province of Arauco has never been explored, as the Indians render it very unsafe; when it is, many fine species will surely be found there.

"Southern Chili," consisting of the provinces of Valdivia and Llanquihue, is one dense forest on the coast and for some forty miles inland, while the central plains are well watered and covered with bush. The species found in this province appear to have a wider range than any other in Chili. The island of Chiloe and part of Chonos must be included in this district. In 1870–71 I was commissioned by the Chilian Government to explore Chonos; and the results of my journey convinced me that nearly all the species occurring there are stragglers from Valdivia, the number of species rapidly decreasing in the south. Few new forms are met with; and amongst these are a very few Magellanic species.

A few of the insects peculiar to this district are *Cicindela gormazi*, *Systolosoma brevis*, all the Chilian *Carabi* except *C. chilensis* and *C. suturalis*, *Pachyteles biguttatus* and *marginicollis*, *Lecanomerus marginatus*, *Lebia azurea*, &c.

About four hundred miles west of Valparaiso is situated the island of Juan Fernandez. I carefully explored this island in 1872, and found that a number of its natural productions were similar to those of Chili, but that many new forms occurred. Of the six species of Carabidæ found there, three are also found in Chili, viz. *Pristonychus chilensis*, *Bembidium punctigerum*, and *B. inconstans*; the others are peculiar, viz. *Trachysarus* (gen. nov.) *pallipes*, *Trechus femoralis*, and *Variopalpus crusoei* (sp. nov.). The neighbouring island, Mas-a-fuera, has, I believe, never been explored entomologically; as a new species of Humming-bird has recently been found there, we may reasonably expect to find some new Coleoptera.

The remaining region, viz. the west coast of South America south of Chonos, appears to furnish but few species; but these are of the highest interest. Amongst the genera I may mention *Migadops*, *Brachycœlus*, and *Antarctonomus*.

Owing to the number of exploring expeditions that have visited Magellan, each obtaining a few species and describing them as new, I fear that some names that figure in the list are only synonyms. I have, however, reduced them as much as possible.

In conclusion I would call attention to the absence of tropical and subtropical forms from Chili. Crossing the Andes from Santiago to Mendoza, say one hundred miles mean distance, one finds the fauna entirely different, Brazilian forms, especially of Copridæ, occurring commonly there; but these cannot pass the lofty Andes, with the exception of some half dozen species that inhabit the higher regions and are found on both sides, and the Chilian fauna has more resemblance to the Australian than to that of any other part of South America. This has already been pointed out by various observers, especially Lacordaire, while Dr. Günther mentions two species of fish, viz. *Mordacia mordax* and *Geotria chilensis*, as occurring in both countries.

My best thanks are due to Mr. H. W. Bates for the kind assistance he has given in determining my species; and any merit that this paper may contain is chiefly due to him.

CICINDELIDÆ.

Subfamily MANTICORINÆ.

AGRIUS FALLACIOSUS.

Agrius fallaciosus, Chevrolat, Ann. Soc. Ent. Fr. 1854, p. 666, pl. 19. fig. 1.

Picnochile magellanicus, Motsch. Etud. Entom. 1856, p. 33, pl. 1. fig. 11.

Polyagrus schythei, Philippi, Ann. Univ. Chile, 1862, xxi. p. 408.

Sandy Point, Straits of Magellan.

Subfamily CICINDELINÆ.

CICINDELA PERUVIANA.

Cicindela peruviana, Lap. Etud. Entom. p. 35, et Sol. in Gay, Hist. Chile, Zool. iv. p. 115.

Occurs, but not commonly, on the southern border of the desert of Atacama; I believe this species has never been taken in Peru, despite its name.

CICINDELA CHILIENSIS.

Cicindela chiliensis, Aud. et Brullé, Arch. du Mus. i. p. 133, t. 9. f. 1.

Cicindela chilensis, Sol. *l. c.* p. 117.

Not uncommon on the banks of the Mapocho, near Santiago.

CICINDELA GORMAZI. (Plate XIII. fig. 3.)

Cicindela gormazi, Reed, Entom. Monthly Mag. viii. 1871, p. 77.

Besides the characters mentioned in my description, this species is distinguished from *C. chiliensis* by its broad apical lunule, the upper lobe of which is short and rounded; in *C. chiliensis* the upper lobe always forms a hook curved upwards and outwards.

A variety of *C. gormazi* occurs, in which all the white marks of the elytra are much broader, the lunules coalescing on the sides with the base of the middle sinuous band.

Taken by Captain Vidal Gormaz, of the Chilian Navy, in the province of Llanquihue*.

CARABIDÆ.

Subfamily MIGADOPINÆ.

MIGADOPS BIMACULATUS, n. sp. (Plate XIII. fig. 7.)

Oblongus, subdepressus, niger nitidissimus; elytris irideis, utrinque macula reniformi rufa ante apicem et versus suturam; capitis vertice macula rufa; thorace transversim quadrato, postice haud angustato, angulis anticis et posticis productis, acutis, margine laterali explanato et valde reflexo; elytris vix striatis.

♂. *Tarsorum anticorum articulis quatuor dilatatis, subtus spongiosis; intermediorum articulis tribus subtus spongiosis, sed vix dilatatis.*

Long. 6 lin.

The perfectly glabrous four basal joints of the antennæ, simple fourth tarsal joint, and large median tooth of the mentum show that this very remarkable insect belongs rather to *Migadops* than to any other of the genera into which the anomalous family Migadopidæ has been divided.

The unique specimen of this species, figured on Plate XIII. fig. 7, was taken by Dr. Pendavis, of the Chilian Navy, on the banks of the river Aysen.

MIGADOPS DARWINII.

Migadops darwinii, Waterhouse, Ann. & Mag. N. H. 1842, ix. p. 138.

Straits of Magellan.

MIGADOPS NIGROCÆRULEA, Waterh. *l. c.* p. 138.

Straits of Magellan.

MIGADOPS OVALIS, Waterh. *l. c.* p. 139, t. 3. f. 3.

Straits of Magellan.

BRACHYCŒLUS VIRESCENS.

Brachycœlus virescens, Waterh. *l. c.* p. 136, t. iii. fig. 2 (*Migadops*).

Brachycœlus duponti, Chaudoir, Bull. Mosc. 1842, p. 848.

Straits of Magellan.

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* *Tetracha chilensis* has been erroneously introduced into the Chilian lists; I have never met with a specimen found in the country.

MONOLOBUS TESTACEUS, Sol. *l. c.* p. 189, t. 3. f. 5.

A specimen of this species, taken by the late Dr. Jerman Krause, at Corral, in Valdivia, is in the collection of H. W. Bates, Esq.

ANTARCTONOMUS PERONI.

Antarctonomus peroni, Chaud. Bull. Mosc. 1861, ii. p. 519.

Straits of Magellan.

Subfamily TRACHYPACHINÆ.

SYSTOLOSOMA BREVE, Sol. *l. c.* p. 242 (1849).

Notioxenus bilunulatum, Motsch. Et. Entom. 1857, p. 111, t. i. f. 9.

Common near the coast in the province of Valdivia and in Chiloe, running rapidly in the sunshine.

Subfamily CARABINÆ.

CARABUS PSITTACUS.

Carabus psittacus, Gerstaecker, Linnæa Entom. xii. p. 425, t. iv. f. 1.

Southern Chili, "Unique, in the Berlin collection."

There is a *Carabus* in the National Museum of Chili that, to a certain extent, resembles this species. It differs, however, in its longer elytra and slightly in marking; and as this species was described from a single specimen, I hesitate to describe a closely allied species without seeing more specimens. The specimen in the Museum was taken many years ago in the "Cordillera Pelada," in Valdivia; and although I have searched assiduously in the same locality, I have not been able to obtain more.

CARABUS SYBARITA, Gerst. *l. c.* p. 426, t. iv. f. 2.

Southern Chili, "Unique, in Dohrn's collection."

CARABUS BUQUETII.

Carabus buquetii, Cast. Etud. Entom. i. p. 158, et Gerst. *l. c.* p. 428, t. iv. f. 4–11.

Carabus chilensis, Guér. Gen. d. Ins. ii. No. 1, pl. 3.

Carabus dorsiger, Motsch. Bull. Mosc. 1865, iv. p. 284.

Carabus chiloensis, Hope, Trans. Entom. Soc. ii. p. 128.

This species is very variable in size, in the form of the thorax, and in the degree of development of the "chain striæ" of the elytra; but it may always be distinguished from its nearest allies by the coarse punctation of the underside of the thorax. I have met with an extreme form which I was at first inclined to consider a separate species; it may be thus characterized:—

CARABUS BUQUETII, var. ELEGANTISSIMUS. (Plate XIII. fig. 5.)

Rather smaller and more slender than the ordinary form; similar in colour except that the thorax is much darker, and its golden margin narrower or imperceptible. In form it is distinguished by the strikingly narrower thorax, the greatest width of which is near the anterior angles, whence the sides are gradually sinuate-angustate to the base, the hind angles being remarkably acute. In some examples the "chain striæ" of the elytra are very strongly marked, the oblong raised intervals of these striæ being smooth and blackish.

The type form of *Carabus buquetii* is the commonest Chilian *Carabus*, but, strange to say, is not mentioned in Gay's work. It is found everywhere in Southern Chili. The var. *elegantissimus* is probably its most southern form, and was taken near Tres Montes (46° S.)

CARABUS GLORIOSUS, Gerst. *l. c.* p. 429, t. iv. f. 6.

Carabus chilensis, var. *β*, Solier, *l. c.* p. 126.

Carabus carinulatus, Motsch. Bull. Mosc. 1865, iv. p. 284.

Occasionally found in the province of Valdivia.

CARABUS MOCHÆ, n. sp. (Plate XIII. fig. 4.)

C. glorioso (Gerst.) *affinis, elongato-ellipticus, modice convexus; supra subopacus, cuprescenti-niger; elytris rubro-cupreis, sutura limboque laterali nigro-violaceis, interstitiis elevatis undique interruptis, alternis elevatioribus; corpore subtus cuprescenti-nigro.*

Long. 11–12 lin.

The thorax in this species is always narrower than that of *C. gloriosus*, and rather more cordate in form, having its greatest width at a short distance from the anterior angles. The elytra are elongate-elliptical. All the depressed portions of their surface are opaque, without distinct striæ; and the narrow raised interstices are interrupted by innumerable transverse impressions, which cause them to appear as rows of shining tubercles. The alternate interstices, however, are more continuous.

Var. In some examples the elytra are dark green in colour, with the suture and a lateral border coppery.

I discovered this fine species on the island of La Mocha, situated some twenty-three miles from the coast of Chili, in lat. 38° S. This island is of Tertiary formation, similar to the coast in front of it, and was evidently at one time connected with the mainland; but I feel sure that my species does not occur on the mainland.

CARABUS VALDIVIÆ.

Carabus valdiviæ, Hope, Trans. Entom. Soc. ii. p. 128; Gerst. *l. c.* p. 431, t. iv. f. 7–13.

Carabus chilensis, Sol. *l. c.* p. 126, t. ii. f. 1.

Small examples of this species resemble very closely robust individuals of *C. buquetii*; but they may always be distinguished by the perfectly smooth undersurface of the thorax.

This species is, after *C. buquetii*, the commonest Valdivian species.

CARABUS CHILENSIS.

Carabus chilensis, Esch. Zool. Atlas, ii. p. 9, t. viii. f. 7; var. *a*, Sol. *l. c.* p. 126.

The most northern form of *Carabus* in Chili; it is only found, as far as I know, near the baths of Chillan.

CARABUS DARWINII, Hope, Trans. Entom. Soc. ii. p. 129.

Carabus indiconotus, Sol. *l. c.* p. 127, t. i. f. 4.

One of the rarest of our *Carabi*, sometimes found on the island of Chiloe and to the south.

CARABUS SUTURALIS.

Carabus suturalis, Fab. Sys. Ent. p. 238; Gerst. *l. c.* p. 436.
Carabus reichei, Guér. Rev. Zool. 1839, p. 297.

Straits of Magellan.

CARABUS SPECIOSUS, Gerst. *l. c.* p. 438, t. iv. f. 3.

I have an example which agrees perfectly with Gerstaecker's description, except in the colour of the elytra, which is golden-coppery like that of the head and thorax, instead of green with coppery suture and margins.

CARABUS MELANOPTERUS, Gerst. *l. c.* p. 439.

I have never seen this species.

CARABUS INSULARIS, Hope, Trans. Entom. Soc. ii. p. 129.

The type of this species is in the collection of Mr. Grut, who considers it a variety of *C. buquetii*.

CALOSOMA VAGANS, Dej. Spéc. Gén. v. p. 564.

This species is common throughout Chili from Atacama to Magellan. I know no other Chilian species of Carabidæ with such a wide distribution.

Subfamily OZÆNINÆ.

PACHYTELES BIGUTTATUS, Sol. *l. c.* p. 182 (*Tropopsis*).

On the sea-coast in Southern Chili.

PACHYTELES MARGINICOLLIS.

Pachyteles marginicollis, Sol. *l. c.* p. 181, t. iii. f. 3 (*Tropopsis*).

With the preceding. I consider the *T. unicolor*, Fairm., a var. of this species.

PACHYTELES GRACILIS.

Pachyteles gracilis, Chaudoir, Ann. Soc. Entom. Belg. xi. 1868, p. 69.

I have never met with this species.

Subfamily BROSCINÆ.

CASCELLIUS EYDOUXII, Guér. Voy. Favor. t. ccxxv. f. 7.

Cascellius kingii, Curtis, Linn. Trans. xviii. p. 189.

Southern Chili, on the coast.

CASCELLIUS ÆNEONIGER.

Cascellius æneoniger, Waterh. Ann. & Mag. N. H. 1841, vi. p. 256.
Cascellius niger, Blan. Voy. Pôle Sud, Zool. iv. p. 19, t. i. f. 13.

CASCELLIUS GRAVESII, Curtis, *l. c.* p. 183.

CASCELLIUS NITIDUS, Waterh. Ann. N. H. 1841, vi. p. 255.

Tierra del Fuego.

CASCELLIUS TROBERTI, Sol. *l. c.* p. 201.

Southern Chili.

This species may be identical with one of the .three preceding; but I have never seen it.

BARIPUS CLIVINOIDES.

Baripus clivinoides, Curtis, Linn. Trans. xviii. p. 185, t. xv. f. 100 (*Cardiophthalmus*).
Tetraodes lævis, Blan. Voy. Pôle Sud, Zool. iv. p. 36, t. iii. f. 6.

Straits of Magellan.

BARIPUS PARALLELUS.

Baripus parallelus, Guér. Voy. Favor. Mag. Zool. ix. t. ccxxvii. f. 1.
Baripus subsulcatus, Sol. *l. c.* p. 240.

Southern Chili. Rare.

CNEMALOBUS DARWINII.

Cnemalobus darwinii, Waterh. Mag. N. H. 1840, iv. p. 356 (*Odontoscelis*).
Odontoscelis curtisii, Waterh. *l. c.* p. 356.

This species is very distinct from the other *Cnemalobi*, and may be at once known by the reflexed borders of the thorax. The type of *C. darwinii* is bottle-green, while *C. curtisii* is black; I can see no other difference between them. They were probably taken in the Straits of Magellan.

CNEMALOBUS OBSCURUS, Brullé, Hist. Ins. iv. p. 374 (1834).

Odontoscelis tentyrioides, Curtis, Linn. Trans. xviii. p. 187, t. xv. f. *d*.
Baripus aterrimus, Chaud. Bull. Mosc. 1835, p. 445.
Cnemalobus cyaneus, Brullé, *l. c.* p. 373.
Cnemalobus cyathicollis, Sol. *l. c.* p. 194.
Cnemalobus germaini, Putzeys, Stett. Zeitschr. 1868, p. 365.
Cnemalobus gayi, Putz. *l. c.* p. 366.
Cnemalobus abbreviatus, Putz. *l. c.* p. 366.
Cnemalobus sulciferus, Philippi, Ann. Univ. Chile, 1864, p. 461.

This very variable species is common on the Andes and the coast-range, at an elevation of from 3000 to 8000 feet s.m.; and despite the number of synonyms that I have given, I believe I have omitted several others. On several occasions I have captured it by thousands and found specimens agreeing more or less with all the above descriptions, but so connected by intermediate links that I feel compelled to unite them. The two following may be distinct, but I doubt it.

Cnemalobus striatus, Waterh. Mag. N. H. 1840, iv. p. 358 (*Odontoscelis*).

Cnemalobus substriatus, Waterh. *l. c.* p. 359 (*Odontoscelis*).

Subfamily Licininæ.

Eutogeneius fuscus, Sol. *l. c.* p. 255, t. iv. f. 8.

The only specimen I have ever seen of this species was found in Valdivia, and is in the National Museum of Chili.

Subfamily Sphodrinæ.

Pristonychus chilensis.

Pristonychus chilensis, Gory, Ann. Soc. Entom. Fr. 1833, p. 232; Sol. *l. c.* p. 228.

This species is placed by recent authors as a synonym of the European *P. complanatus*. I can see little or no difference between them; yet I have hesitated to unite them. Common in Chile and in the island of Juan Fernandez.

Subfamily Anchomeninæ.

Anchomenus distinctus, Sol. *l. c.* p. 203 (*Agonum*).

Anchomenus dejeanii, Sol. *l. c.* p. 205 (*Agonum*).

Anchomenus cordicollis, Sol. *l. c.* p. 206 (*Agonum*).

Anchomenus gayi, Sol. *l. c.* p. 207 (*Agonum*).

Northern Chili.

Anchomenus ambiguus, Sol. *l. c.* p. 209 (*Agonum*).

The name *ambiguus* was preoccupied by Erichson for a Tasmanian species; as this, however, proves to belong to a distinct genus (*Cyclothorax*, W. Macleay), Solier's name may stand. This species is found in Southern Chili.

Anchomenus chilensis.

Anchomenus chilensis, Dej. Spéc. Gén. v. 724; Sol. *l. c.* p. 208 (?) (*Agonum*).

The commonest species of the genus in Central and Southern Chili.

Anchomenus melas, Sol. *l. c.* p. 210 (*Agonum*).

Nearly as common as the preceding in Central Chili.

Anchomenus circumdatus, Erichson, Meyen's Reise, Ins. p. 348.

Scarce. Southern Chili.

*15. semiciner
*16. scutata .
17. cinnamom
18. mustelina
19. vulpina .
20. subrufa .
21. castanea .
22. [illegible]....
23. [illegible] .
24. brunnestict
25. terrestris.
26. [illegible] .
27. fuliginosa
*28. palpebral
29. erythroth
30. [illegible] .
*31. [illegible]
32. phryganop
33. [illegible] .
34. [illegible] ..
35. [illegible]
36. curtata ..
37. erythrops
*38. ruficornis .
39. striaticolli
40. [illegible]
41. subcristata
*42. [illegible] .
43. striaticeps
*44. albiceps ..
*45. albicapilla
46. [illegible]
47. [illegible]
48. [illegible]
49. [illegible]
*50. humilis
51. [illegible]
52. sulphurif
53. patagonic
54. [illegible]
55. [illegible]
56. [illegible]..
57. flammul
58. [illegible]

[illegible]

[illegible] among every-

[illegible] Baron Chaudoir,

[illegible] Soc. xviii. p. 193.

[illegible] allied to *A. chilensis*, but

[illegible]

ANTARCTIA BLANDA, Dej. Spéc. Gén. iii. p. 529.

Specimens of this species taken near Valdivia do not not differ in the slightest from others received direct from the Falkland Islands, with which I have compared them.

ANTARCTIA EURYPTERA, Putz. *l. c.* p. 25.

A large species distinguished by its broad and depressed elytra; said to have been found on Mas-a-fuera Island.

ANTARCTIA LATIGASTRICA.

Antarctia latigastrica, Dej. *l. c.* p. 258; Sol. *l. c.* p. 250.

Common near Santiago.

ANTARCTIA LATICOLLIS.

Antarctia laticollis, Sol. *l. c.* p. 253; Putz. *l. c.* p. 30; Motsch. Bull. Mosc. 1865, xxxviii. pt. 2. p. 270.

The description agrees with that of Solier, as far as it goes; and although Motschulsky does not quote that author, I think his is the same species.

ANTARCTIA PUNCTICOLLIS, Putz. *l. c.* p. 31.

ANTARCTIA COMPLANATA, Blan. Voy. Pôle Sud, Zool. iv. p. 37.

Apparently closely allied to *A. latigastrica*, and possibly synonymous with *A. harpaloïdes*, Curtis.

ANTARCTIA CHALYBEA, Blan. *l. c.* p. 38.

ANTARCTIA GLAUCA, Blan. *l. c.* p. 39.

Subfamily PTEROSTICHINÆ.

TRIRAMMATUS UNISTRIATUS.

Trirammatus unistriatus, Dej. *l. c.* p. 232 (*Pœcilus*); Sol. *l. c.* p. 237 (*Feronia*).

Pterostichus prasinus, Curtis, *l. c.* p. 192.

Var. *Trirammatus fulgidus*, Chaud. Ann. Soc. Entom. France, 1835, p. 446.

A very common species in Central and Southern Chili.

FERONOMORPHA ÆREA.

Feronomorpha ærea, Dej. *l. c.* p. 279 (*Feronia* (*Omaseus*)); Sol. *l. c.* p. 224.

Omaseus marginalis, Curt. *l. c.* p. 191.

Very common and widely distributed in Central and Southern Chili.

FERONOMORPHA LUCIDA, Curtis, *l. c.* p. 192.

Nortes sulæneus, Motsch. Bull. Mosc. 1864, p. 249.

FERONOMORPHA FISCHERI, Sol. *l. c.* p. 222.

FERONOMORPHA SULCATA, Sol. *l. c.* p. 223.

FERONOMORPHA RUFESCENS, Sol. *l. c.* p. 225.

LAGARUS CHILENSIS.

Lagarus chilensis, Dej. *l. c.* p. 251 (*Feronia* (*Argutor*)); Sol. *l. c.* p. 232 (*Feronia*).

This species has the metathoracic episterna long and narrow, the prosternum distinctly margined at the end, the hind tarsi grooved at the sides; but the elytra have a long scutellar striole, unlike the typical *Lagari*. The thoracic foveæ are single on each side and sulciform, similar to the North-American *Lagarus erythropus*.

Common in Central Chili.

PTEROSTICHUS ERRATICUS.

Pterostichus erraticus, Guér. Mag. Zool. 1838, t. 225. f. 3. (*Platysma*).

Pterostichus rufipalpis, Curtis, *l. c.* p. 192, 1838.

Pterostichus bonellii, Waterh. Ann. Nat. Hist. 1841, vii. p. 123.

PTEROSTICHUS TENUESTRIATUS, Motsch. Bull. Mosc. 1864, p. 262 (*Parhypates*).

PTEROSTICHUS PROFUNDESTRIATUS, Motsch. *l. c.* p. 263 (*Parhypates*).

PERCUS ALIENUS, n. sp. (Plate XIII. fig. 8.)

Elongatus, subparallelus, niger subnitidus, palpis piceis; capite postice haud angustato, oculis vix prominentibus; antennis paulo compressis; thorace elongato quadrato-cordato, postice gradatim sinuatim angustato, angulis posticis rectis, basi lævi, foveis profundis; elytris humeris rotundatis, postice paululum dilatatis, apice late rotundatis sinuatis, supra punctato-striatis, interstitiis paulo convexis, tertio unipunctato.

Long. 9–9½ lin. ♂ ♀.

This species offers all the chief characters of the European genus *Percus*, of which it has also the facies, resembling a small, slender *P. siculus*. The elytra are destitute of basal fold, the scutellum lying on the depressed pedicle; behind, the margins are a little explanated before the sinuation, and have there two marginal striæ exterior to the row of large punctures. There are no humeral carinæ; and the striæ are rather loosely and not deeply punctured; a rudiment of basal striole exists in the form of a fovea on each side of the apex of the scutellum. The fovea on each side of the base of the thorax is distant from the angle, broad and deep; the dorsal line also terminates behind in a deep impression.

This species is possibly the *Feronia* (*Platysma*) *convexipennis*, Fairmaire, Coléop. Chil. pt. i. p. 1; but as that author places it in the section *Platysma*, to which it has not the slightest resemblance, and does not mention the absence of basal fold to the elytra, which is the most conspicuous feature of the species, the identity is much open to doubt. Even if it be the same, Fairmaire's name cannot be adopted, as his description has never been published, his paper not being obtainable by the usual means through commerce, and therefore not admissible according to the rules established by Zoological Congresses.

This species was taken by the late Dr. Krause at Corral, in Valdivia.

FORTAX METICULOSA.

Feronia meticulosa, Dej. Spéc. Gén. v. p. 762; Sol. *l. c.* p. 234 (*Feronia*).

Fortax meticulosa, Motsch.

Feronia obscuripennis, Sol. *l. c.* p. 236.

Common in Central Chili.

FORTAX BLANDA.

Feronia (*Steropus*) *blanda*, Erich. Meyen's Reise, Ins. p. 348.

Feronia marginata, Waterh. Ann. Mag. N. H. 1841, vii. p. 124.

? *Feronia parvula*, Sol. *l. c.* p. 236.

Differs from *F. meticulosa* in its smaller size (3½ to 4 lines), shining elytra in both sexes, and reddish legs. Occurs with the preceding, but is much less common.

Subfamily HARPALINÆ.

POLPOCHILA CHILENSIS.

Polpochila chilensis, Chaudoir, Bull. Mosc. 1837, vii. p. 19 (*Melanotus*).

Polpochila parallela, Sol. *l. c.* p. 217 (1849).

This genus has received four names, in the following order of date:—*Melanotus*, Dej., 1831 (name preoccupied in *Coleoptera*); *Polpochila*, Solier, 1849; *Cratocara*, Leconte, 1863; and *Phymatocephalus*, Schaum, 1864.

In Gay's work this species is stated to be 1½ line long and 2 lines wide, and to have been found in Valdivia. My specimens, however, are 6 lines long, and were found in Central Chili.

PARAMECUS LÆVIGATUS.

Paramecus lævigatus, Dej. Spéc. Gén. iv. p. 45; Sol. *l. c.* p. 197.

Common throughout Chili. The two following appear to be varieties of this variable species:—

PARAMECUS PARALLELUS, Chaud. Bull. Mosc. 1843, iv. 779.

PARAMECUS NIGER, Cast. Etud. Entom. i. p. 68; Sol. *l. c.* p. 198.

ANISOTARSUS LÆVIS.

Anisotarsus lævis, Curtis, Linn. Trans. xlviii. p. 194 (*Harpalus*).

Harpalus æquilatus, Sol. *l. c.* p. 258.

Very common in Central Chili.

ANISOTARSUS PUNCTOBASIS, Sol. *l. c.* p. 259 (*Harpalus*).

I have not seen this species, and am not sure that it belongs to the genus.

Anisotarsus chilensis, Dej. iv. p. 294 (*Harpalus*).

This species, which varies much in colour, is common in Valdivia.

Anisotarsus amœnus, Sol. *l. c.* p. 260 (*Harpalus*).

Anisotarsus rufus, Brullé, D'Orb. Voy. Ins. p. 35 (*Anisodactylus*).

Chilian specimens agree with those from the Pampas, except that the thorax is less rounded on the sides, and the row of punctures on the third, fifth, and seventh interstices is less distinct and regular. Although the mentum has a distinct tooth, and the soles of the tarsi are "spongiose," this species cannot be an *Anisotarsus*, its head having the form of that in *Geopinus* and allied genera. I do not propose a new generic name, in the doubt whether it may not belong to the little-known genus *Cylloscelis* of Curtis.

Lecanomerus marginatus, n. sp.

Nigro-piceus, nitidus, elytris æneo-tinctis; palpis, antennis pedibusque flavotestaceis; thoracis margine exteriore elytrisque margine lato posteriore rufescentibus; thorace elytris dimidio angustiore, subquadrato, postice vix angustato, angulis rotundatis, supra lævi, foveolis latis vix impressis; elytris postice paulo dilatatis, ante apicem sinuatis, subtiliter striatis, striis suturali, octava et nona per totam longitudinem, cæteris apice solum impressis.

Long. 3 lin. ♂ ♀.

? *Nemaglossa brevis*, Sol. *l. c.* p. 215.

This species agrees very well with Solier's description of his *Nemaglossa brevis*; but the generic characters he gives are quite at variance with our insect. He describes the ligula as very narrow, and the paraglossæ as broad and attached to it; but the ligula of the species above described is elongate-quadrate, and the paraglossæ are narrow and spring from the lower part of the side of the lingua, curving away from it.

The only structural difference I can find between our species and the type of the Australian genus *Lecanomerus* is the rather larger basal joint of the anterior tarsi in the male. In the mode of dilatation of the second and third joints of the four anterior tarsi, their clothing, the form of the palpi and mentum, and in the facies of the species there is the greatest similarity.

Occurs in Southern Chili, but is by no means common.

TRACHYSARUS, nov. gen.

(τραχὺς, rough, σάρος, brush).

Four anterior tarsi of the male with four joints moderately dilated, the fourth subbilobed, and all furnished beneath with a brush of coarse scaly hairs, not arranged in pairs as in the true *Harpali*, nor as a fine even brush as in the *Anisodactyli*. Palpi, terminal joint fusiform, attenuated and truncated at the apex, not hairy, except a few bristles at the apex of the penultimate joint. Mentum with a pointed tooth in the emargination. Surface of the body impunctate.

TRACHYSARUS PALLIPES. (Plate XIII. fig. 6.)

Acupalpus pallipes, Germ. An. Univ. Chile, 1855, p. 387.

This species, peculiar to the island of Juan Fernandez, was first taken by M. Germain, and described by him as *Acupalpus pallipes*; but, as I have shown, it is not an *Acupalpus*; and even if it were, the specific name *pallipes* was preoccupied by Dejean for a species from Dalmatia. During my visit to Juan Fernandez I took a dozen under stones on the beach.

TRACHYSARUS ANTARCTICUS, n. sp.

Oblongus, fusco-æneus, nitidus; antennis, tibiis, tarsis elytrorumque margine postico et palpis rufo-piceis, his apice pallidis; thorace parvo, quadrato, postice perparum subsinuatim angustato, angulis posticis obtusis sed distinctis, foveis basalibus, latis, punctulatis; elytris parallelis, postice vix sinuatis, supra acute striatis; interstitiis subplanis, tertio post medium unipunctato, secundo ad basin dilatato ibique striola brevi.

Long. 3 lin. ♂ ♀.

The male tarsi are only moderately dilated, the joints broad and short, the fourth bilobed, and all densely hairy on the sides, with the squamulæ irregular. The epistome has two foveæ on the sides, in each of which is a sharp line curving to the margin of the eye. The antennæ are rather long, with the third joint densely pubescent, and some hairs on the second. The palpi have no short hairs. The central tooth of the mentum is short and acute. The scutellar striole is sometimes long, and sometimes reduced to a fovea at the extreme base. All the striæ are distinct, the seventh, eighth, and ninth much broadened at the apex.

I took half a dozen specimens of this species in Valdivia.

BRADYCELLUS IMPRESSIFRONS, Sol. *l. c.* p. 265 (*Acupalpus*).

I am not sure that this species is not a *Tachycellus*. The middle tarsi of the male are very slightly dilated, and their fourth joint is broad and subbilobed; but I cannot detect any squamulæ on their soles. There is a tooth in the emargination of the mentum; the thorax has distinct hind angles, and the scutellar striole is absent.

From the neighbourhood of Santiago.

BRADYCELLUS RUFICOLLIS, Sol. *l. c.* p. 267 (*Acupalpus*).

Closely allied to *B. impressifrons*, but with the thorax bright red instead of black. I have seen only females.

Central Chile.

BRADYCELLUS UNISTRIATUS.

Bradycellus unistriatus, Dej. Spéc. Gén. v. p. 851 (*Acupalpus*); Sol. *l. c.* p. 269 (*Acupalpus*).

I have not seen any Chilian specimens of this species exactly agreeing with Dejean's description, but have taken an insect differing only in colour, being of a dark brassy-green hue. It has distinct hind angles to the thorax; and the sutural and ninth striæ only are deeply impressed throughout. In some examples there is a long and fine scutellar striole exterior to the sutural striæ. Dejean had only one example.

Southern Chili.

BRADYCELLUS TIBIALIS, Sol. *l. c.* p. 268 (*Acupalpus*).

Very similar to *B. unistriatus*, but much smaller, with black femora and rounded hind angles to the thorax.

Central Chili.

BRADYCELLUS CHILENSIS.

Bradycellus chilensis, Dej. *l. c.* p. 850 (*Acupalpus*); Sol. *l. c.* p. 271 (*Acupalpus*).

Common throughout Chili.

BRADYCELLUS ARCOBASIS, Sol. *l. c.* p. 270 (*Acupalpus*).

Differs from *B. chilensis* almost solely in its larger size. Equally common.

Obs.—All the above species have a distinct tooth in the emargination of the mentum, and therefore belong to the genus *Bradycellus* of modern authors, and not to *Acupalpus*. The males have the anterior tarsi only very slightly dilated; and when there is a scutellar striole, it is always exterior to the first stria.

ACUPALPUS (?) **PALLIDUS**, Sol. *l. c.* p. 264.

ACUPALPUS (?) **BIFOSSULATUS**, Sol. *l. c.* p. 266.

I have not been able to recognize either of the above among the large series of this group which I have collected in Chili; I do not know, therefore, whether they really belong to the genus *Acupalpus*.

Subfamily TRECHINÆ.

MERIZODUS ANGUSTICOLLIS, Sol. *l. c.* p. 186.

This genus is very closely allied to *Oöpterus* of New Zealand; and I am informed by Mr. H. W. Bates that his *Oöpterus maceyi*, from the Falkland Islands, is a *Merizodus*, having a bifid tooth to the mentum; in *Oöpterus* this tooth is simple.

This species is not uncommon in Southern Chili.

TRECHUS CHLOROTICUS, Putzeys, Stett. Zeit. 1870, p. 19.

TRECHUS FERRUGINEUS.

Trechus ferrugineus, Brullé, D'Orb. Voy. Ins. p. 43; Putz. *l. c.* p. 20.

TRECHUS RUFICOLLIS, Putz. *l. c.* p. 31.

TRECHUS OBSCURICORNIS, Putz. *l. c.* p. 32.

TRECHUS CYCLOPTERUS, Putz. *l. c.* p. 40.

Trechus depressicollis, Putz. *l. c.* p. 47.

Trechus hololissus, Putz. *l. c.* p. 153.

Trechus politus.

Trechus politus, Brullé, *l. c.* p. 43; Putz. *l. c.* p. 167 (nec Solier, *l. c.* p. 154).

Trechus lævissimus, Putz. *l. c.* p. 169.

Trechus proximus, Putz. *l. c.* p. 169.

Trechus parvicollis, Putz. *l. c.* p. 170.

Trechus scapularis, Putz. *l. c.* p. 170.

Trechus axillaris, Putz. *l. c.* p. 171.

Trechus angustatus, Sol. *l. c.* p. 155; Putz. *l. c.* p. 191.

Trechus monolcus, Putz. *l. c.* p. 191.

Obs.—Many of the above species described by Putzeys being from the collection of M. Germain, who brought to Europe many insects from the Argentine Pampas, as well as from Chili, it is very possible that some may not be really Chilian. Indeed I observe that Putzeys cites sometimes as a locality "Pampas de Chili," a strange geographical confusion, there being no Pampas in Chili. Species so mentioned I have excluded from the above list. I have only met with *T. scapularis*, *politus*, *monolcus*, and *lævissimus*.

Trechus nitidus.

Trechus nitidus, Germain, Anales de la Universidad de Chile, 1855, p. 387.

Trechus punctiventris, Germ. *l. c.* p. 388.

Trechus depressus, Germ. *l. c.* p. 388.

Trechus femoralis, Germ. *l. c.* p. 389.

From the island of Juan Fernandez. This is a very distinct species, not mentioned by Putzeys. Allied to *T. antarcticus*.

Thalassobius testaceus, Sol. *l. c.* p. 157.

Supposed to have been found at Valdivia.

Æmalodera limbata, Sol. *l. c.* p. 152.

Var. *centromaculata*, Sol. *l. c.* p. 152.
Var. *fumosa*, Sol. *l. c.* p. 152.

Found on the sea-coast in Southern Chili.

Æmalodera dentomaculata, Sol. *l. c.* p. 151.

With the preceding.

Subfamily BEMBIDIINÆ

TACHYS HYDROPHILUS, Germ. *l. c.* p. 389 (*Bembidium*).

From the description, this species no doubt belongs to the almost universally distributed genus *Tachys*.

PERICOMPSUS CIRCULIFORMIS, Sol. *l. c.* p. 165 (*Bembidium*).

Common in Central Chili. An undoubted *Pericompsus*.

BEMBIDIUM (PHILOCHTHUS) NIGRITUM, Sol. *l. c.* p. 167.

BEMBIDIUM (PERYPHUS) MACULIFERUM, mihi (Gemm. & Har. Cat.).

Bembidium maculatum, Sol. *l. c.* p. 163 (name preoccupied).

BEMBIDIUM (PERYPHUS) SPINOLÆ, Sol. *l. c.* p. 161.

Southern Chili.

BEMBIDIUM (PERYPHUS) CHILENSE, Sol. *l. c.* p. 162.

I have met with no *Peryphus* so small as the present one, stated by Solier to be only 1½ line long. The description in other respects applies to some specimens of *P. spinolæ*; and as the sizes given in Gay's work are seldom exact, I believe this insect is a variety of *P. spinolæ*.

BEMBIDIUM DERBESII, Sol. *l. c.* p. 163.

The affinities of this species are towards the European *B. pallidipenne* and *kusteri*; but it has narrower elytra.

Central Chili.

BEMBIDIUM (LOPHA) ELEGANS, Sol. l. c. p. 164.

BEMBIDIUM (NOTAPHUS) PUNCTIGERUM, Sol. *l. c.* p. 166.

Common on the mountains of Aculeo.

BEMBIDIUM (NOTAPHUS) SERVILLEI, Sol. *l. c.* p. 174.

BEMBIDIUM (NOTAPHUS) AUBEI, Sol. *l. c.* p. 174.

Found on the banks of the river Mapocho, in Central Chili. I have seen it under the MS. name of *B. nivale*; but I believe that it has never been redescribed under that name.

BEMBIDIUM VARICOLOR, mihi.

Bembidium convexiusculum, Sol. *l. c.* p. 171 (1849), nec *convexiusculum*, Motsch. 1846.

This species approaches the true *Bembidia* (*B. impressum* &c.) in form; but it does not belong to the same group, the eighth and ninth striæ being close together. The colour is variable, bright brassy, dark bronze, and bluish green.

Common in Southern Chili.

BEMBIDIUM CHLOROSTICTUM, n. sp.

Quoad formam B. paludoso *simillimum, sed striis* 8^{ma} *et* 9^{na} *approx-*

imatis. Cupreum vel nigro-cupreum, nitidum; antennis, palpis pedibusque nigris; sulcis frontalibus latis; thorace transversim quadrato, postice perparum angustato, angulis posticis fere rectis, fovea utrinque basali magna punctulata, plicaque elevata elongata juxta angulum; elytris striis omnibus paulo impressis, punctatis, interstitio tertio punctis duobus impressis et vittulis duobus nigro-æneis lævissimis.

Long. 2 lin.

The form of the thorax and the discoloured shining streaks on the third elytral interstice, near the punctures, give this species a strong resemblance to *B. paludosum* and its allies; but the closely approximate eighth and ninth striæ (united near their bases) show that it does not belong to the same group.

Taken on the sea-coast of the Island of Chiloe.

BEMBIDIUM MANDIBULARE, Sol. *l. c.* p. 161.

This species seems to be variable in regard to the proportion of brassy black and pale testaceous markings on the elytra; and I suspect the insect known in some collections under the MS. name of *B. fryi* is only a variety of it.

Southern Chili.

BEMBIDIUM SOLIERI, mihi, Gemm. & Har. Cat.

B. incertum, Sol. *l. c.* p. 168 (name preoccupied).

BEMBIDIUM MARGINATUM, Sol. *l. c.* p. 169.

BEMBIDIUM FISCHERI, Sol. *l. c.* p. 170.

BEMBIDIUM SEXFOVEOLATUM, Germ. *l. c.* p. 389.

Common in Central Chili, especially in the mountains of Aculeo.

BEMBIDIUM SCITULUM, Erich. Nov. Act. Leop. Carol. 1834, Suppl. p. 225.

B. fabricii, Sol. *l. c.* p. 176.

In the neighbourhood of Santiago.

BEMBIDIUM MELANOPODES, Sol. *l. c.* p. 177.

BEMBIDIUM INCONSTANS, Sol. *l. c.* p. 172.

Subfamily DROMIINÆ.

CROSSONYCHUS VIRIDIS, Dej. Spéc. Gén. v. p. 356 (*Dromius*); Chaudoir, Bull. Mosc. 1848, p. 97.

This species varies much in colour, from clear brassy green and coppery to dull olive-green, and in shape of thorax and strength of striation of elytra; and as all gradations exist, it is impossible to separate the following extreme forms as species:—

Dromius æneus, Dej. *l. c.* p. 357 = *Coptodera ænescens*, Motsch. Bull. Mosc. 1864, p. 223 = *Coptodera incerta*, Sol. *l. c.* p. 145 (?).

CROSSONYCHUS CHLOROPTERUS, Motsch. Bull. Mosc. 1864, p. 223.

This species is common throughout Chili.

MIMODROMIUS CYANIPENNIS, Brullé, Hist. Nat. des Ins. iv. p. 195, t. 6. f. 4 (*Dromius*).

Calleida cyanoptera, Sol. *l. c.* p. 137.
Mimodromius cyanipennis, Chaud. Berl. Entom. Zeit. 1873, p. 55.

I have found this species under bark of *Salix babylonicus*, near Santiago.

MIMODROMIUS CHILENSIS, Sol. *l. c.* p. 137 (*Calleida*).

MIMODROMIUS PHILIPPII, n. sp. (Plate XIII. fig. 1.)

Major, elongatus, depressus, castaneofuscus, nitidus; elytris utrinque ante medium macula rotundata fulvo-testacea.

Long. 5 lin.

This fine species is very similar to *M. chilensis*, but with the elytra broader and flatter. The head is similarly elongated and tapering behind the eyes, and at the end of the narrowing constricted into a distinct neck. The thorax is relatively small, subcordate, with the hind angles produced and acute. The elytra are widened behind, and very obtusely but broadly truncated at the apex; their surface is faintly punctato-striate, with the interstices punctulate.

A few specimens have been taken near the baths of Chillan.

MIMODROMIUS NIGROFASCIATUS, Sol. *l. c.* p. 135 (*Calleida*).

Common throughout Chili.

MIMODROMIUS GUTTULA, Sol. *l. c.* p. 136 (*Calleida*).

Less common than the preceding. I have only taken it at from 4000 to 8000 feet s. m., in the Andes of the central provinces.

Obs.—The genus *Mimodromius* was proposed by Baron Chaudoir in the Berliner entom. Zeitschrift, 1873, p. 55, but without characters. These are as follows:—Head elongated, narrowed behind. Mentum trilobate; side lobes triangular, acute. Ligula narrow and scarcely more corneous than the broad paraglossæ, which are adherent; apex bisetose. Palpi truncated, the labials having their terminal joint tumid and subsecuriform. Legs slender; penultimate joints of the tarsi sharply emarginate but not bilobed; claws slender and finely pectinated.

This genus is well distinguished from *Calleida* by the penultimate joints of the tarsi not being bilobed, and by the slender form of the same members, together with their claws.

PLAGIOTELUM IRIDEUM, Sol. *l. c.* p. 133.

Calleida iridea, Motsch. Bull. Mosc. 1864, iii. p. 238.

Southern Chili; scarce.

LOBIUS CYANEUS, Dej. *l. c.* p. 355, et Sol. *l. c.* p. 139 (*Dromius*).

Lobius cyaneus, Motsch. Bull. Mosc. 1864, iii. p. 230.

A common species in Southern and Central Chili.

LOBIUS NIGROVIRIDIS, Motsch. *l. c.* p. 230.

LOBIUS (?) ERYTHROPUS, Sol. *l. c.* p. 139 (*Dromius*).

Obs.—The genus *Lobius* is well distinguished from *Dromius* and its allies by the rather long, linear, and sharply truncated apical joints of the palpi. The mentum has a rather large tooth in its centre.

DROMIUS SULCATULUS, Sol. *l. c.* p. 139.

DROMIUS NIGROTESTACEUS, Sol. *l. c.* p. 142.

Common in Central Chili.

Obs.—*Dromius pictus*, Sol. *l. c.* p. 141, is no doubt a *Mimodromius*, and not a Chilian, but a Pampa species. The following I do not know:—

DROMIUS CHILENSIS, Dej. *l. c.* p. 358.

DROMIUS MACROCEPHALUS, Sol. *l. c.* p. 140.

OXOIDES OBSCURUS, Sol. *l. c.* p. 148.

I have never met with this insect. According to Solier it is distinguished from *Dromius* by the terminal joints of the palpi being tumid and oval; the labials briefly truncated, the maxillaries acute.

In these characters *Dromius sulcatulus* approaches it rather closely. The description of the species coincides pretty well with small examples of *D. sulcatulus*; and I strongly suspect it to be nothing more than the male of that species.

VARIOPALPUS CRUSOEI, n. sp.

V. humerali *forma similis; at differt oculis multo magis prominentibus, thorace rufo, elytrisque distincte striatis. Depressus, nigropiceus, palpis, pedibus elytrisque utrinque maculis duabus fulvo-testaceis; capite nigropiceo, collo rufescente; thorace breviter cordato, angulis posticis productis rectis paulo explanatis, lobo basali distincto; elytris striis omnibus integris late impressis: macula prima magna paulo obliqua ab humeris striam primam attingente, macula secunda apicali; margine laterali pallido.*

Long. 1¼ lin.

I found this species under stones at an elevation of 1000 feet on the Island of Juan Fernandez.

VARIOPALPUS HUMERALIS, Sol. *l. c.* p. 149.

A common insect in Central Chili.

VARIOPALPUS BREVICOLLIS, Germ. Ann. Univ. Chile, 1855, p. 386 (*Cymindis*).

Differs from *V. humeralis* in the rather more robust antennæ and in the shorter thorax. The elytra are shining piceous, with obsolete striæ; the head black; the rest of the body pale rufo-testaceous.

I do not know whence Germain obtained this insect.

Obs.—The genus *Axinopalpus*, Leconte, two years posterior in date to *Variopalpus*, does not differ from the latter, which is therefore a group generally distributed in America, being found in the Atlantic States, in California, in New Granada, Brazil (undescribed species), and in Chili.

OMOSTENUS MACULIPENNIS, Sol. *l. c.* p. 130.

If I am right in my determimation of this species, it is nothing but a *Dromius* with the shoulders of the elytra very narrow. One specimen, taken by Dr. Krause, is in the collection of H. W. Bates, Esq.

Subfamily CYMINDINÆ.

CYANOTARUS ANDINUS, Germ. An. Univ. Chile, 1855, p. 386 (*Dyscolus*). (Plate XIII. fig. 2.)

This species differs much from *Cymindis* in the thicker posterior part of the head; more elongate, cordate thorax, with straight hind margins; rounder shoulders of the elytra; very short metasternum, and hairy palpi. Hence it is necessary to form a new genus for its reception.

It occurs in the high Andes, in Central Chili, and is rare.

Subfamily CALLEIDINÆ.

EUPROCTUS FASCIATUS, Sol. *l. c.* p. 132.

Occurs in the Andes.

CALLEIDA TIBIALIS, Brullé, D'Orb. Voy., Ins. 15.

Baron Chaudoir states that he received a Chilian specimen of this insect from Solier.

Subfamily LEBIINÆ.

LEBIA AZUREA, Sol. *l. c.* p. 146.

Appears to be very rare. I have seen but two specimens of this species.

EXPLANATION OF PLATE XIII.

Fig. 1. *Mimodromius philippii*, n. sp., p. 68.
2. *Cyanotarus andinus*, p. 70.
3. *Cicindela gormazi*, p. 52.
4. *Carabus mochæ*, n. sp., p. 54.
5. *Carabus buquetii*, var. *elegantissimus*, p. 53.
6. *Trachysarus pallipes*, p. 63.
7. *Migadops bimaculatus*, p. 52.
8. *Percus alienus*, p. 60.

8. Notes on the Myology of the *Phrynosoma coronatum*. By Alfred Sanders, M.R.C.S., F.Z.S., Lecturer on Comparative Anatomy at the London Hospital Medical College.

[Received November 27, 1873.]

From several specimens of lizards, for which I was indebted to the courtesy of Mr. Garrod, I selected the subject of the present memoir, thinking, and as the event proved, correctly, that the singularity of its external form might be correlated with equal singularities in its muscular arrangements. According to Duméril and Bibron * the genus *Phrynosoma* comprises three species. Of these, a figure of one, *P. harlanii*, is given in Cuvier's Animal Kingdom by Griffiths, under the name of *Agama cornuta*, and of another by Wiegmann†, *P. orbiculare*; but neither of these figures corresponds exactly with my specimen, differing as they do in slight details; but the description of the third species, *P. coronatum*, agrees better than either, and it is therefore this name which is adopted in the following pages.

This animal, as well as *Liolepis belli*, a memoir on the myology of which I had the honour of presenting to the Zoological Society last year ‡, belongs to the family of the Iguanas. As will be seen, the arrangement of its muscles differs considerably from that of *Iguana tuberculata*, an exhaustive treatise on which was read by Mr. Mivart in 1867§.

Platysma myoides (fig. 1, *P.M.*). This muscle resembles the one which occurred in *Liolepis belli*. Its anterior fibres run transversely from one ramus of the mandible to the other superficially, being inserted into the inner edge for the whole length, with the exception of a small portion anteriorly; the posterior fibres are inserted into the connective tissue at the side of the neck. At the outer edge of the muscle a few fibres are separated from the remainder by a small interspace; but in the mid line they are all continuous; the posterior border is situated slightly in front of the anterior edge of the muscles of the shoulder. This muscle appears to correspond to the thin plane of muscular fibre marked by Mr. Mivart in the memoir above referred to as mylo-hyoid in front, and platysma myoides behind; but in the present subject it is one continuous muscle. That it is not the mylo-hyoid is plain; for it has no attachment to the hyoid bone; moreover the true mylo-hyoid, which is absent in *Phrynosoma*, is to be found in *Liolepis belli*, which also possesses the homologue of this platysma. If the above interpretation be correct, on the removal of this muscle we immediately come to the

Genio-hyoglossus (fig. 1, *G.H.*), which arises from the distal extremity of the thyro-hyal and its second segment for about half its length; the superficial fibres pass forward and are inserted into the symphysis of the mandible, while the deeper fibres are inserted into the outer edge of the tongue. The part of this organ to which these fibres are attached is separated from the central portion by a deep furrow; this is the case on each side, so that this animal appears to have three tongues—a central one broad, fleshy and blunt, which is flanked by a pair, smaller and pointed.

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* Erpétologie Générale, tom. iv. p. 314.

† Herpetologia Mexicana, tab. viii. fig. 1.

‡ P. Z. S. 1872, p. 154. § *Ibid.* 1867, p. 766.

Hyoglossus (fig. 1, *H.G.*), slightly overlapped by the last, arises from the distal extremity of the thyro-hyal; the fibres pass obliquely forward and inward, and partly join those of its fellow of the opposite side by means of a raphe; some of the other fibres are inserted into the glosso-hyal, while the remainder pass into the lower side of the central part of the tongue, in the substance of which they pass forward to its anterior extremity. The two preceding muscles do not appear to be represented in the *Iguana**.

Cerato-hyoid arises from the whole length of the thyro-hyal and the segments which together form the posterior cornu of the os hyoides; the internal and deeper fibres are inserted into the proximal end of the anterior cornu (cerato-hyal) for two thirds of its length; the external and more superficial fibres pass on to be inserted into the side of the mandible in front and dorsad of the insertion of the neuro-mandibularis, extending forward for nearly half its length; an additional bundle of fibres arises from the extreme distal end of the cerato-hyal to join the last-mentioned fasciculus. Whether this corresponds to the cerato-mandibular I am not sure from the memoir on *Iguaua*; but on referring to the description of the myology of *Chamæleon parsonii* by the same author†, I find that it does not exactly agree with any of the muscles of the throat in either of those species.

Omo-hyoid (figs. 1, 2, & 3, *O.H.*) arises from the inner surface of the scapula, from a line going obliquely from the anterior to the posterior edge; and passing forward and ventrad, its superficial fibres are inserted into the posterior edge of the basihyal, while the deeper fibres spread out and are attached to about two thirds of the distal end of the thyro-hyal and the proximal end of its second segment; the muscles of the two sides meet in a point at the middle line.

There are two sterno-hyoids, as in *L. belli*. The one, very narrow, arises from the sternum ventrad of the sterno-mastoid, and, passing forward in front of the sterno-hyoideus profundus, is inserted into the dorsal surface of the thyro-hyal close to its articulation with the basihyal. The other, which appears to correspond to the sterno-hyoideus profundus in *L. belli*, although in its origin it is more superficial than the former, arises from a space on the ventral surface of the sternum left vacant by the pectorales majores, extending for about one third its length from the anterior edge of that bone. The muscles of both sides meet in a point posteriorly in the mid line; anteriorly each spreads out into a broad and thin expansion, which is inserted into the external half of the thyro-hyal. The single sterno-hyoid of *P. japonicus* ‡ appears to correspond to the latter of the two preceding muscles.

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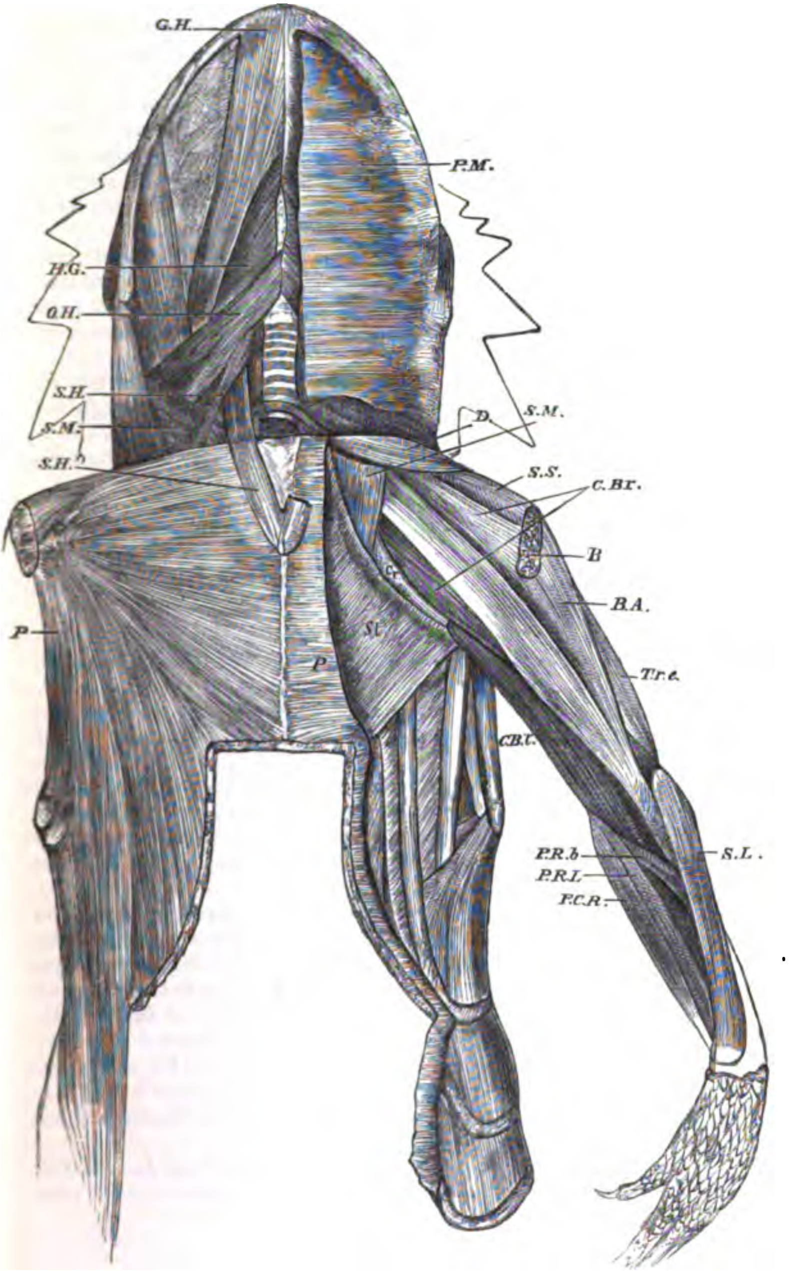
* *Loc. cit.*

† P. Z. S. 1870, p. 850.

‡ *Ibid.* 1870, p. 414.

Fig. 1.



Superficial muscles on the ventral aspect of the anterior half of the body. × 3.

Sterno-mastoid (figs. 1 & 3, *S.M.*) arises from the anterior end of the articular surface between the sternum and the clavicle, and from the extremity of the cross piece of the interclavicle; it passes forward and dorsad to be inserted into the posterior surface of the cranium, between the origins of the digastric and the complexus.

Neuro-mandibularis (fig. 3, *N.*) in this species runs obliquely downward and forward, instead of directly downward as in *L. belli* and *P. japonicum*. It arises from the outer edge of the complexus, as in those lizards, and from the fascia of the back at the level of the scapula, and is inserted into the posterior point of the mandible. This muscle does not appear to be represented in *Iguana**.

Ectopterygoid is very small, and only corresponds to the internal part of the same muscle in *L. belli* and *P. japonicum*; it is covered by the muscles of the hyoid arch, and arises from the external edge of the pterygoid, and is inserted into the inner surface of the angle of the mandible.

Temporalis is a much less extensive muscle than in either *P. japonicum* or *L. belli*. It is triangular, and arises from what appears to be the squamosal and postfrontal, anterior to the quadrate; it is inserted into the upper surface of the mandible, in front of the articulation of that bone with the quadrate.

Entopterygoid (fig. 3, *En.P.*) is the principal muscle for moving the lower jaw. It arises from the posterior apophysis of the parietal, from the squamosal, and also from the anterior side of the quadrate, and is inserted into the upper edge of the mandible for about one third of its length, in front of the articulation with the quadrate. A muscle which I interpret as being homologous with the tensor tympani does not appear to be present in *Iguana*; it arises from the columella, and from the anterior and upper point of the prootic, covered by both pterygoids, and is inserted into the pterygoid bone; it was found in both *P. japonicus* and *L. belli* as well as in the present subject.

Digastric (fig. 3, *Di.*) arises from the point where the squamosal and exoccipital meet, and descends to be inserted into the posterior end of the mandible immediately above the insertion of the neuro-mandibularis. This appears to represent the posterior part of the digastric of the human subject.

The dorsal muscles appear to follow the usual arrangement. The sacro-lumbalis commences in the tail, and is partly inserted into the ilium, from which bone it takes a fresh origin. The longissimus dorsi is not distinguishable from the spinalis dorsi; they both commence in the caudal region. The complexus resembles that of *L. belli*; neither a trachelo-mastoid nor a transversalis colli could be found. A small muscle arises from the transverse process of the axis above the insertion of the levator scapulæ, and is inserted into the basi-occipital; this differs from the rectus posticus of *L. belli*, and perhaps represents a rectus lateralis.

Rectus anticus major resembles the same muscle in *L. belli*, but in addition arises from the four cervical and three anterior dorsal ribs.

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* P. Z. S. 1867, p. 766.

Rectus abdominis has the same attachments as in *L. belli.* Its anterior portion is extremely thin, and is covered by a connective tissue loaded with pigment-cells, which tissue also covers over the sacro-lumbalis.

It is a singular fact that there is not the slightest trace of a trapezius in this lizard.

Latissimus dorsi (figs. 2 & 3, *L.D.*) has an extraordinary arrangement in this subject. It arises from the spines of the third and fourth dorsal vertebræ, as a narrow muscular band which passes straight across the back, over the posterior end of the scapula, until it reaches the second dorsal rib, from which it takes a fresh and more extensive origin; the external fibres of this part of the muscle arise more posteriorly, from the third, fourth, and fifth dorsal ribs. The whole passes forward and ends in a flat tendon, which is inserted as usual into the posterior surface of the humerus just behind the insertion of the teres minor. It sends off a tendinous slip to join the inner head of the triceps—an arrangement which occurs also in *Iguana*, according to Mr. Mivart*. That part of the muscle which is situated between the scapula and the vertebral column was so closely attached to the skin as to be with difficulty dissected from it.

Levator scapulæ (fig. 3, *L.S.*) arises from all that portion of the suprascapula which is not occupied by the infraspinatus, with the exception of a small portion situated at the junction of the dorsal with the posterior border; it passes forward to be inserted into the transverse process of the axis.

Sterno-coracoidalis resembles in every respect the corresponding muscle of *L. belli.*

Sterno-coracoidalis externus (fig. 2, *Sc.e.*) arises from the internal surface of the coracoid, close to its lower or articular edge, and a short distance from its anterior point, and passing backward is inserted into the outer angle of the sternum covered by the ligament of the triceps. There are three serrati (fig. 2, *S.A.* 1, *S.A.* 2, & *S.P.*) precisely resembling those of *L. belli.*

Supraspinatus (fig. 1, *S.S.*) arises from the anterior margin of, and from the membrane covering the coracoid fenestra, and is inserted into the anterior and outer point of the humerus in front of and nearer the head of the bone than the infraspinatus.

Infraspinatus (fig. 3, *I.S.*) arises from the central portion of the outer surface of the scapula and suprascapula, and from the anterior edge of that bone at the scapulo-clavicular articulation; it is inserted into the outer edge of the humerus, just beyond the insertion of the supraspinatus.

Teres minor (fig. 3, *Ts.M.*) arises from the inner edge of the scapula at its point of junction with the coracoid; it passes beneath the clavicle, and being, as usual, bound down by a tendon from the long head of the triceps, is inserted by muscular fibres into the humerus, commencing immediately within and just behind the anterior border of the insertion of the infraspinatus, and extending obliquely backward and ventrad to the base of the tuberosity of the humerus, extending beyond the insertion of the last.

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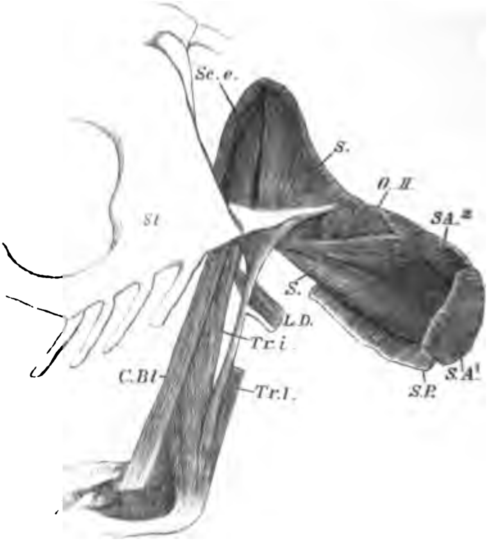
* P. Z. S. 1867, pp. 768, 780.

Fig. 2.



Muscles on the inner aspect of the arm. × 3.

The supraspinatus corresponds to the muscle named by Mr. Mivart epicoraco-humeral in *Iguana*, and subclavius in *Chamæleon parsonii*. The infraspinatus does not appear to be represented in *Iguana*, but might correspond to one of the suprascapulars in *Chamæleon*. Teres minor corresponds to infraspinatus in *Iguana*, but is not found in *Chamæleon*. In my two former papers I took the liberty of differing from Mr. Mivart in the interpretation of these three muscles, and explained my reasons for so doing; but perhaps it will save the trouble of referring to those memoirs, if I briefly recapitulate those reasons in the present place. First, as to the insertions, they are all inserted on the outer side of the humerus, or close to it, at a point which corresponds to the greater tuberosity; these insertions occur in the following order, viz. the supraspinatus nearest the head of the bone, the infraspinatus next, and the teres minor* furthest off—an arrangement which closely agrees with that found in the human subject. Next, with regard to the origins of these muscles: supraspinatus arises from the coracoid bone together with the epicoracoid and præcoracoid, which might well represent the supraspinous fossa; the infraspinatus arises from the surface of the scapula proper, which might be taken to represent the infraspinous fossa, while the teres minor arises from the edge of the bone; all these facts appear to me to point in the same direction. In a paper entitled "On the homologies of certain muscles connected with the shoulder-joint"*, Prof. Rolleston points out that the epicoraco-humeral [my supraspinatus] is homologous with the subclavius. In a memoir which was published in the same volume of the Transactions of the Linnean Society, "On the Myology of the *Orycteropus capensis*," Mr. Galton showed that the subclavius in that animal has, among other insertions, one into the fascia covering the supraspinatus; and, seeing that the nerve which in anthropotomy supplies the supraspinatus arises from the same cord of the brachial plexus as, and close to, the one which supplies the subclavius, we have a body of evidence to show that, although the ingenious line of argument adopted by Prof. Rolleston satisfactorily proves that the muscle in question represents the subclavius, yet it is quite possible that it is partly homologous with the supraspinatus also, viz. in its insertion.

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* In a lizard, however, which I have recently dissected, a species of the subgenus *Tropidolopisma*, this muscle ends in a tendon which winds round the humerus to be inserted close to the head of the bone, quite on the inner side, being covered by the internal head of the triceps.

Subscapularis (fig. 2, *S.*) arises in two portions—one from the whole of the inner surface of the coracoid (with the exception of a small part on the inner edge) and from a small portion of the scapula adjacent, the other from the surface of the scapula close to its junction with the suprascapula. These two sections join together at rather more than a right angle, and are inserted into the inner side of the head of the humerus and into the capsular ligament of the shoulder-joint.

Deltoid (figs. 1 & 3, *D.*) arises from the ventral half of the clavicle and from the interclavicle, and is inserted into the outer side of the humerus just beyond the head of that bone. This appears to represent the clavicular portion only of the muscle, and the part marked D1 by Mr. Mivart in *Iguana.*

Pectoralis major (fig. 1, *P.*) has the usual arrangement.

Biceps (fig. 1, *B*) arises, as usual, by a broad musculo-tendinous origin from about the anterior and inner third of the outer surface of the coracoid; it passes down the arm and is inserted by a broad tendon into the contiguous surfaces of both the radius and ulna in conjunction with the

Brachialis anticus (figs. 1 & 3, *B.A.*), which arises from the outer surface of the humerus for about two-thirds of its length, commencing just beyond and outside the insertion of the pectoralis major; its insertion joins that of the biceps.

Coraco-brachialis longus (figs. 1 & 2, *C.B. l.*) arises narrow and fleshy from the posterior point of the coracoid, and is inserted into about the distal third of the inner side of the humerus and into the ventral surface of the inner condyle.

Coraco-brachialis brevis (fig. 1, *C.Br.*), short and broad, arises from the whole surface of the coracoid ventrad of the coracoid fenestra, and is inserted into the ventral surface of the humerus for about half its length, commencing at the head.

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* Trans. Linn. Soc. vol. xxvi. pt. 3.

Triceps (figs. 1 & 3, *Tr. e.*) in this species has four origins. The outer head arises from the external surface of the humerus for nearly its whole length, commencing immediately within the insertion of the infraspinatus.

The long head (figs. 2 & 3, *Tr. l.*) arises from the posterior border of the scapula just above the glenoid cavity, and gives a tendon which passes across the teres minor in the usual manner to be inserted into the humerus close behind the anterior level of the insertion of the infraspinatus.

The inner head (fig. 2, *Tr. i.*) is divided into two distinct portions: one part arises by muscular fibres from nearly the whole length of the inner surface of the humerus; at about the junction of the distal with the middle third it joins the other portion, which arises by a narrow tendon from a ligamentous band, which goes from the external angle of the sternum to the inner surface of the scapula, dorsad of its point of junction with the coracoid; at the point of insertion the tendon spreads out into a broad expansion, one end of which is attached to the above-mentioned ligament, while the other end is connected to the posterior angle of the coracoid close to the origin of the coraco-brachialis longus. All four heads join together, and developing a sesamoid bone in the substance of their common tendon are inserted into the proximal end of the ulna. The arrangement of this muscle in this species is just opposite to that found in *P. japonicum*, in which lizard the outer head, and not the inner head, is the one which is divided into two parts*.

Extensor carpi ulnaris (fig. 3, *E.C.U.*) arises by two heads—one by a flat tendon from the outer condyle of the humerus, the other fleshy from the proximal end of the ulna; it is inserted by a narrow tendon into the base of the metacarpal bone of the fifth digit.

Supinator longus (figs. 1 & 3, *S.L.*) arises from the external condyle of the humerus, and is inserted into the whole length of the radius.

Extensor longus digitorum (fig. 3, *E.L.*) arises from the outer condyle close to the last; half of it goes to join that muscle at about the distal third of the radius; the remainder develops three short tendons, which are inserted into the base of the 2nd, 3rd, and 4th metacarpal bones; the tendon for the fourth digit is given off higher up than the other two.

Extensor ossis metacarpi pollicis (fig. 3, *E.M.*) seems very constant; in this species it is a triangular muscle precisely resembling that of *L. belli*.

Extensor brevis digitorum (fig. 3, *E.B.*) consists of five short muscular slips which arise from the dorsal surface of the carpus; each of these slips ends in a tendon which is inserted into the terminal phalanx of its respective digit.

There are two muscles which have the attachment of pronators of the forearm. The first may be called

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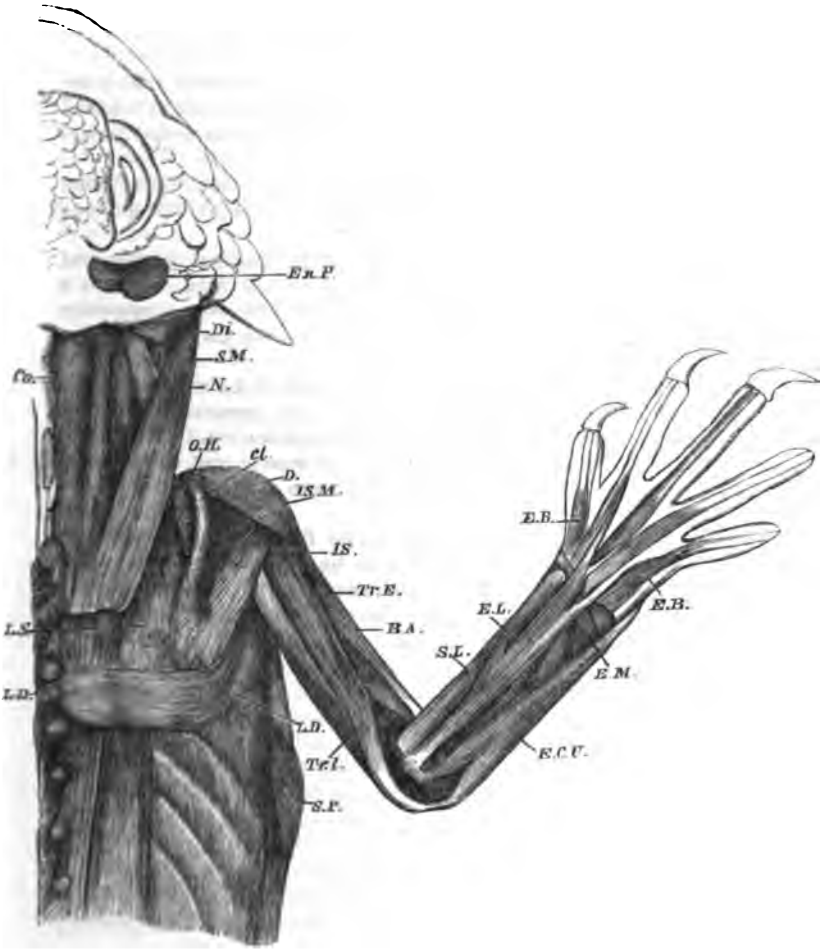
* *Loc. cit.* p. 416.

Pronator radii longus (fig. 1, *P.R.L.*) ; this arises from the inner condyle of the humerus, and passing obliquely down the arm is inserted into the distal extremity of the radius ; the second,

Fig. 3.



Superficial muscles on the dorsal aspect of anterior half of the body. × 3.

Pronator radii brevis (fig. 1, *P.R.b.*) : this arises from the outer side of the internal condyle covered by the last, and is inserted into the lower end of the proximal third of the radius. This latter appears to correspond to the pronator accessorius of the *Iguana tuberculata*, in which species, according to Mr. Mivart, both muscles are represented; in *L. belli* the longus only occurred; but neither were found in *P. japonicum*.

Flexor carpi ulnaris arises by two heads—one from the inner condyle in conjunction with the extensor digitorum perforans, the other from the proximal end of the ulna; this part is in intimate connexion with the extensor carpi ulnaris; the whole is inserted into the pisiform bone and into the flexor surface of the base of the metacarpal bone of the fifth digit.

Flexor carpi radialis (fig. 1, *F.C.R.*) arises from the inner condyles, also in conjunction with the flexor perforans, and is inserted into the radial side of the first digit, being closely attached to the scaphoid in its passage across the carpus.

Flexor perforatus digitorum arises, as usual, from a tendinous band across the wrist; it gives off a slip for each digit, the tendons dividing for the passage of the perforans.

Flexor perforans digitorum arises from the internal condyle and from about two thirds of the proximal end of the ulna; it forms a broad tendinous expansion in the palm, which receives a muscular slip from the ulnar side of the carpus, and then divides into five tendons, one for each digit.

The superficial muscle on the ventral aspect of the thigh does not extend so forward as the one in *L. belli* or *P. japonicum*; I therefore conclude that the first muscle in those species, viz. the sartorius, is absent from *P. coronatum*, and that the muscle met with immediately beneath the skin represents the more posterior and deeper muscle, viz. the

Gracilis (figs. 4 & 6, *G.*), which arises from a small portion of the posterior end of the ischio-pubic ligament[*], from the pubic symphysis by means of a thin aponeurosis, and from the ventral angle of the ischium; it becomes more contracted in descending the thigh, and is inserted by a narrow tendon on the inner surface of the tibia not far distad of the knee-joint.

Transversus perinei (fig. 4, *Tr. P.*) is well marked in this specimen; it arises as in *L. belli*, from the cartilaginous rod which is the continuation backward of the ischio-pubic symphysis, and, forming a broad plane of muscular fibre, is inserted into the ilio-ischiatic ligament, or that ligament which extends from the ischium on the ventral surface to the posterior point of the ilium dorsad. This muscle is placed in front of the cloacal aperture; it appears to correspond to the transversus perinei in *Iguana*, but not to the muscle described under the same name in *Chamaeleon*. Behind it are several small muscles devoted to the office of opening or closing this orifice; of these the

Dilatator cloacae (fig. 4, *D.C.*) arises from the connective tissue beneath the hypapophyses of the 5th and 6th caudal vertebrae; and passing forward in the central line, it divides into two branches, like the letter Y, which are inserted, one on each side of the cloacal aperture, into the connective tissue of its posterior lip.

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[*] Which is the tendinous band extending from the lamellar process of the pubis to the ischium.

Sphincter cloacæ (fig. 4, *Sp. C.*).—The fold of skin which forms the posterior boundary of the cloacal aperture encloses a muscular band, which appears to perform the function of a sphincter, although it is not homologous with the sphincter ani; it arises from the ilio-ischiatic ligament behind the transversus perinei, and then passes behind the cloaca to be inserted on the opposite side in the same manner and at the corresponding place.

Retractor cloacæ (fig. 4, *R.C.*) arises by two origins from the transverse processes of the sixth and seventh caudal vertebræ, which pass forward and unite together into one muscular fasciculus, the superficial fibres of which are inserted into the posterior border of the last a short distance on the outside of the mid line, while its deeper fibres pass beneath to be inserted into the outer edge of the cloaca; some of the fibres also spread out over the anterior margin of the same.

Constrictor cloacæ (fig. 4, *C.C.*) arises from the transverse process of the third caudal vertebra, and is inserted near the apex of the cartilaginous rod which is attached to the posterior end of the symphysis ischii, above the posterior part of the origin of the transversus perinei; its fibres are attached to the side of the cloaca in their course, so that they are capable of constricting it.

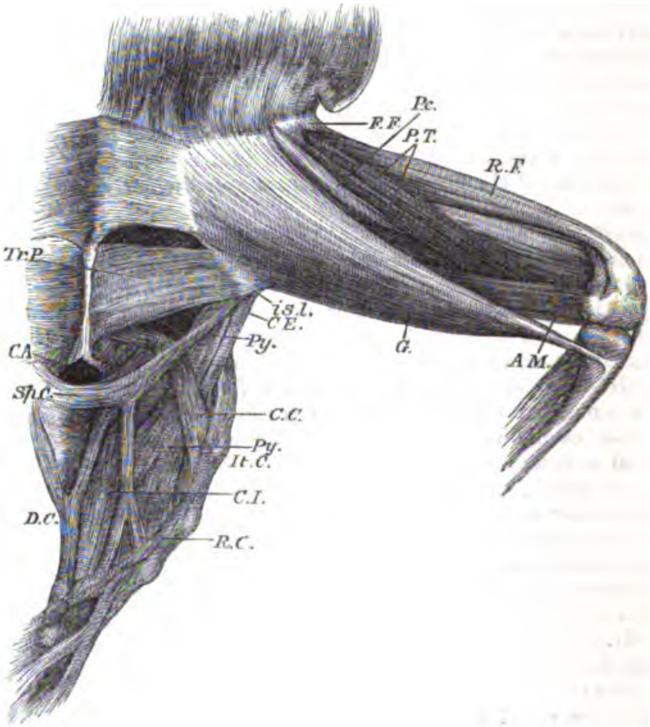
Intertransversalis caudæ (figs. 4 & 5, *It. C.*) is a muscle which runs along the extremities of the transverse processes of the six anterior caudal vertebræ; posteriorly it blends with the ordinary caudal muscles; anteriorly it unites with the under surface of the sacro-lumbalis, and is attached to the posterior end of the ilium.

Adductor magnus (fig. 4, *A.M.*) arises by a flat tendon from the ilio-ischiatic ligament beneath the origin of the gracilis, and is inserted fleshy into the internal condyle of the femur and into the interarticular cartilage of the knee-joint. No muscle corresponding to this was found in either *P. japonicum* or *Liolepis belli*: neither is it mentioned by Mr. Mivart as occurring in *Iguana*. There appears to be a muscle somewhat like it in *Chamæleon*; but, from the description, I should imagine that it does not extend so far as the condyles.

Pectineus (fig. 4, *Pc.*) arises from a point of the ischium behind and internal to the acetabulum, and from the deep surface of the aponeurosis which covers the lower surface of the pubis and ischium. Its origin is a broad expanse of muscular fibre; it is inserted into the ventral surface of the femur, occupying one fourth of its length on the proximal side of the central point. I am uncertain whether to call this pectineus or an adductor; the point in favour of its being pectineus is, that its insertion is more towards the ventral surface than would be the case if it corresponded to an adductor.

Pelvo-tibialis (fig. 4, *P.T.*) may be described as arising by two heads, one from the anterior division of the flexor femoris, the other from the outer and anterior edge of the pubis, in front and rather to the inside of the origin of the rectus femoris; each head is an elongated narrow muscular ribbon, which proceeds down the thigh; the two joining together form a short tendon, which penetrates the knee-joint and is attached to the tendon of the semimembranosus, which is inserted into the outer edge of the tibia between it and the fibula. This muscle therefore resembles the corresponding one of ***L. belli*** in having two heads and being inserted into the tibia, but differs in the two heads being closer together, in the tendon passing through the joint, and in joining the semimembranosus; it differs from the same muscle in ***P. japonicum*** by being double and joining the semimembranosus, but resembles it in passing through the joint. Mr. Mivart has figured this muscle both in ***Iguana*** and ***Chamæleon*** under the name of tibial adductor.

Fig. 4.



Superficial muscles on the ventral aspect of the posterior extremity. × 3.

Pyriformis (fig. 4, ***Py.***) resembles the same muscle in ***L. belli*** and ***P. japonicum*** in general appearance, but differs slightly in origin, inasmuch as it is not attached to the centre of the caudal vertebræ, but only to the inner end of the under surface of the transverse processes of the sixth to the first inclusive; it passes as usual through the pulley formed by the ilio-ischiatic ligament, and is inserted into the femur at the posterior border of the pectineus. The tendon, which passes down the thigh, is inserted into the interarticular cartilage of the knee-joint, and does not join any muscle of the leg, as it does in *L. belli*, where this tendon, after joining that of the gastrocnemius, is inserted into the back part of the head of the fibula. In that memoir * I was induced to consider this muscle homologous with the pyriformis by reason of its general aspect. It arises from the under surface of the caudal vertebræ, a surface which is continuous with the under surface of the sacrum †; its tendon passes out of the pelvis over a pulley, as it were, formed by a ligament which goes from the posterior end of the ilium to the outer and posterior angle of the ischium, and which I have ventured to name the ilio-ischiatic ligament. Now this ligament appears to occupy the position of the greater sacro-ischiatic ligament in the human subject. These facts give this muscle quite the facies of a pyriformis. Meckel was so struck with this resemblance that he remarked that it "entspricht dem birnförmigen Muskel des Menschen" ‡. It corresponds to the muscle termed femoro-caudal § by Mr. Mivart in the *Iguana* and *Chamæleon*; the muscle termed pyriformis in the former appears to be partly represented in my specimen by a muscle which I have termed coccygeus externus. As a figure of the pyriformis was given in my memoir on *L. belli*, I did not consider it necessary to repeat it.

Coccygeus externus (figs. 4 & 5, *C.E.*) arises from the lower edge of the outer extremity of the transverse processes of the first and second caudal vertebræ, and is inserted into the ilio-ischiatic ligament at a point corresponding to the origin of the semitendinosus and behind the quadratus femoris.

Coccygeus inferior (fig. 4, *C.I.*) or internus (ischio-caudal in *Chamæleon*) resembles that muscle in *L. belli* in every thing except that it arises only from the fifth and sixth caudal vertebræ instead of from the tenth to the third.

Iliacus arises from the lower surface of the symphysis ischii and from the inner end of the same aspect of the pubis; the fibres converge and are inserted into the summit of the trochanter of the femur. It resembles the same muscle in *L. belli*, and corresponds to the second and third part of the pectineus as figured in Mr. Mivart's paper on the *Iguana*. My reasons for considering this to be homologous with the iliacus in anthropotomy are as follows:—In the first place the insertions agree; for it appears to me that there can be no doubt that the trochanter of the femur in lizards is the tibial trochanter, and therefore corresponds with the trochanter minor in human anatomy. Secondly, although the fibres are not derived from the right bone, they face as it were the right direction, viz. towards the ventral surface of the body. That the muscles termed iliacus in *Iguana* are wrongly so interpreted will appear upon the consideration that they are situated on the outer side of the limb instead of the lower or ventral side, and that the fibres face dorsad instead of ventrad. As the latter muscle arises from the same bone as the iliacus in my specimen, that point need not be discussed.

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* *Loc. cit.* p. 173.

† In the *Tropidolepisma* referred to above, I found that the anterior fibres of this muscle actually arise from the under surface of the second vertebra of the sacrum.

‡ Vergleichende Anatomie, Theil iii. pp. 152, 153.

§ The Rev. Prof. Haughton has described this muscle in the Crocodile, under the name m. extensor femoris caudalis, Ann. Nat. Hist. 1868; it is also mentioned by Dr. Günther in his memoir on the lizard *Hatteria*, in Trans. Roy. Soc. 1867.

Iliacus externus is simply a dismemberment of the iliacus, but has a distinct origin and insertion; it arises from the whole length of the posterior edge of the pubis, and is inserted into the front part of the trochanter beyond the iliacus and extending between it and the insertion of the pyriformis. It differs from the same muscle in *L. belli* only in not being connected with the origin of the pelvo-tibialis; it corresponds with pectineus No. 1 in *Iguana*.

Obturator externus arises from the ventral or lower surface of the ischium, extending from the mid line as far outward as the external angle of the same, and is inserted into the posterior and outer surface of the femur, behind the trochanter and close to the head. This nearly resembles the same muscle in *L. belli,* except that it does not cover the ischio-pubic foramen. This is figured in my paper on *L. belli,* and also in fig. 17 of Mr. Mivart's paper on *Iguana.*

The muscles on the dorsal or upper aspect of the ischium and pubis are not so complicated as in *L. belli*; neither are they connected in so intimate a manner; instead of four there are only two muscles in this species, the flexor femoris and flexor tibialis not being represented, or rather one muscle combining the properties of the two; it may therefore retain the name of

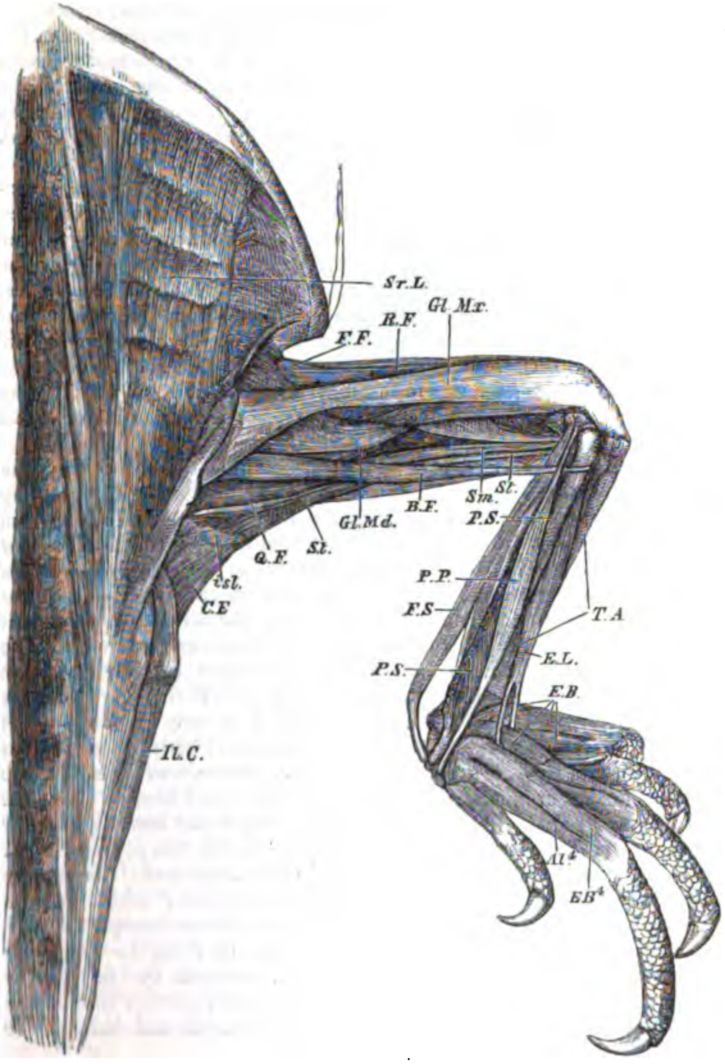
Flexor femoris (figs. 4 & 5, *F.F.*). This arises from the inner half of the dorsal surface of the pubis, and from the external half of its ventral surface and also from its anterior edge. The part from the anterior edge becomes merged into the pelvo-tibialis; while the posterior portion is inserted into the anterior and inner surface of the femur close to the head of that bone, passing behind the origin of the rectus and in front of the vastus externus; this corresponds to the second section of the iliacus in *Iguana.* A muscle figured in my paper on *L. belli,* and there termed flexor tibialis, appears to correspond to the first part of the iliacus in *Iguana.*

Obturator internus arises from the dorsal surface of the whole length of the ischium and from the posterior two thirds of the ischio-pubic ligament; it passes out of the pelvis behind the last, and ends in a narrow tendon which is inserted into the posterior surface of the femur a short distance from the head; this corresponds to the third portion of the iliacus in *Iguana,* while a muscle not found in this specimen, but figured in *L. belli* under the name of flexor profundus femoris, appears to be the same as the fourth section of the iliacus in *Iguana.*

Rectus femoris (figs. 4 & 5, *R.F.*) in this species has only one origin, from the edge of the pubis in front of the acetabulum; it ends in the usual manner to coalesce with the two vasti to form the quadriceps or, rather, in this case, the triceps extensor femoris, and is inserted by means of the ligamentum patellæ into the head of the tibia.

Vastus externus commences in a point close to the head, covering the tendon of the obturator internus. The vastus internus is, as usual, much the smaller, and occupies only the distal half of the femur; the

Fig. 5.



Superficial muscles on the dorsal aspect of the posterior extremity. × 3.

externus is situated more anteriorly, and the internus more posteriorly. The crureus cannot be separated as a distinct muscle.

Gluteus maximus (fig. 5, *Gl. Mx.*) is more distinct from the rectus than in *L. belli*, and still more so than in *P. japonicum*. It arises from the whole length of the posterior apophysis of the ilium, and joins the vastus externus at about the centre of the thigh. This is the same as gluteus maximus in *Iguana*, but not in the Chameleon.

Biceps femoris (fig. 5, *B.F.*) arises from near the posterior end of the posterior apophysis of the ilium by means of a narrow tendon, and, passing down the thigh, is inserted into the outer side of the fibula a short distance beyond the head of the bone; its tendon is crossed by that of the peronæus; this corresponds to the ilio-peroneal in *Iguana*.

Semimembranosus (figs. 5 & 6, *Sm.*) arises fleshy from the postero-external angle of the ischium and from the ventral end of the ilio-ischiatic ligament; its belly forms an elongated cone, which becomes at the distal half of the thigh a long thin tendon, which receives the tendon of the pelvo-tibialis, and is inserted into the outer edge of the head of the tibia, passing through the knee-joint on its way. In this species the semimembranosus of *L. belli* and the principal section of that muscle in *P. japonicum* appear to be absent; but this muscle would seem to represent that section of the semimembranosus which in *P. japonicum* was inserted between the tibia and fibula, close to the insertion of the pelvo-tibialis, and corresponds to the second portion of the semimembranosus in *Iguana*.

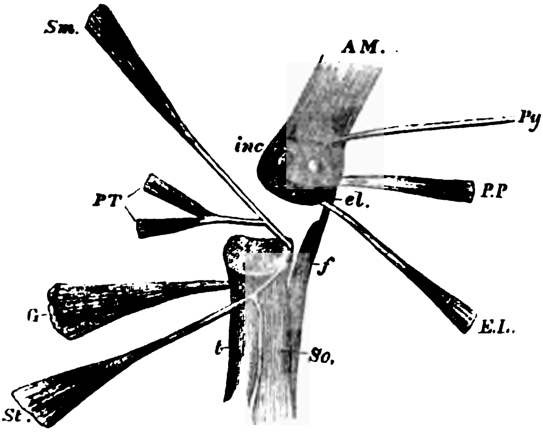
Semitendinosus (figs. 5 & 6, *St.*) arises immediately behind the last, from the posterior part of the ilio-ischiatic ligament, extending nearly as far as the posterior end of the ilium. It ends in a long thin tendon, which is inserted into the external edge of the head of the tibia close to the insertion of the pelvo-tibialis; it also gives off two supplementary tendons, one of which goes to the inner side of the tibia, close to the insertion of the gracilis, the other goes down the leg along the inner edge of the soleus; this clearly corresponds to the biceps in *Iguana*. I am still of opinion that the interpretation of these three muscles is in the main correct. With regard to their origins they maintain the relations found in the human subject (semimembranosus arising ventrad of the others) both in the present specimen and in *L. belli* and *P. japonicum*, where, moreover, the two latter muscles are inserted into the inner side of the head of the tibia. With regard to the ilio-peroneal, both its origin and insertion appear to me to agree very well with those points in the biceps; and Prof. Rolleston in the memoir above referred to remarks that "this muscle is clearly one of the series made up of the biceps &c.," which opinion might perhaps justify me in adhering to my former interpretation.

Gluteus medius (fig. 5, *Gl. Md.*) arises fleshy from the outer side of the anterior two thirds of the ilium, covered by the gluteus maximus, and is inserted into the outer and posterior side of the femur for nearly half its extent beyond the head and behind the origin of the vastus externus.

Quadratus femoris (fig. 5, *Q.F.*) arises from the posterior point of the ilium behind the biceps femoris and in front of the semitendinosus; it is inserted into the proximal end of the femur dorsad of the insertion of the pyriformis.

Soleus (fig. 6, *So.*), the most superficial muscle on the back of the leg, arises from the posterior surface of the head of the tibia; the semitendinosus is inserted close to its origin, and gives off a tendon which borders its inner edge. The muscle in question terminates in a broad thin membranous tendon which is lost over the tarsus, but is more particularly attached to the cuboid and outer side of the metatarsal bone of the fifth digit; this appears to be the tibial head of the soleus, the gastrocnemius not being represented. This muscle is not present in *L. belli*, but is met with in *P. japonicum*, where it was named extensor tarsi, and where its origin accords more with one head of the soleus of anthropotomy in arising from the middle of the shaft instead of from the head of the tibia.

Fig. 6.



Arrangement of the tendons surrounding the knee-joint. × 3.

Flexor perforatus digitorum (fig. 5, *F.S.*) arises from the outer condyle of the femur. It ends in two bellies, one of which joins the deep flexor; the other expands into a broad tendon, which is attached on one side of the tarsus to the cuboid, and on the other to the tibial side of the astragalo-calcaneus. From this broad tendon two muscles continue on to the sole: these are perforated for the passage of the perforans tendon, one being inserted on each side of the base of the first phalanx of the first digit, the other on each side of the base of the first phalanx of the second digit. The third digit also has a perforatus; but this arises independently from the cuboid, and is inserted like the other two: the fourth and the fifth digits have no perforatus.

Peronæus primus (fig. 5, *P.P.*), like that of *L. belli*, arises from the external condyle of the femur by a flat but narrow tendon, expands in the leg into an elongated muscular mass, and terminates in a long thin tendon which is inserted into the cuboid.

Peronæus secundus (fig. 5, *P.S.*) arises from the distal four fifths of the fibula, and is inserted into the posterior edge of the cuboid.

Flexor perforans digitorum arises from rather less than the proximal fourth of the fibula; it receives a muscular slip from the perforatus, and terminates in a broad tendon in the sole, which, passing over the tarsus, receives a musculo-tendinous slip from the tibialis posticus; the tendon for the fifth digit is given off first as usual, in this case opposite the proximal end of the cuboid; four other tendons subsequently arise, which are inserted into the distal phalanx of their respective digits. A muscular slip arises from the cuboid to be inserted into the fibular side of the broad part of the tendon. Four muscular slips, which together form a *Flexor accessorius*, arise from this part of the tendon; that for the fourth digit, from the superficial surface, ends in a long tendon inserted into the third phalanx of that digit; the three others are derived from the deep surface, and are inserted respectively into the base of the first phalanx of the second, third, and fourth digits.

Tibialis posticus resembles the muscle of that name in *L. belli*.

Extensor longus digitorum (fig. 5, *E.L.*) arises as usual from the front part of the external condyle of the femur by a tendon which passes through a groove formed by the head of the fibula and that of the tibia; it terminates by two tendons, which are inserted, one into the fibular side of the base of the third, and the other into the corresponding side of the fourth metatarsal bone.

Tibialis anticus (fig. 5, *T.A.*) resembles that muscle in *L. belli*, except that it has no supplementary tendon.

Extensor brevis digitorum (fig. 5, *E.B.*) resembles the same muscle in *L. belli*, but is not so complicated. It arises from the cuboid, and gives a slip to each of the digits from the first to the third; the fourth has an extensor muscle to itself, which, together with an abductor for the same digit, arises from the cuboid.

In the sole there is an adductor digitorum, consisting of three slips, which, crossing the sole obliquely, are inserted respectively into the base of the first phalanx of the hallux and the second and third digits. There are also three palmar interossei, but no appearance of lumbricales.

LIST OF EXPLANATORY LETTERS USED IN THE WOODCUTS.

They are the same in all.

A.M.	Adductor magnus.
B.A.	Brachialis anticus.
B.F.	Biceps femoris.
C.B.l.	Coraco-brachialis longus.
C.B.br.	Coraco-brachialis brevis.
C.C.	Constrictor cloacæ.
C.E.	Coccygeus externus.
C.I.	Coccygeus internus.
D.	Deltoid.
D.C.	Dilatator cloacæ.
E.B.	Extensor brevis digitorum.
E.C.U.	Extensor carpi ulnaris.
E.L.	Extensor longus digitorum.
E.M.	Extensor metacarpi pollicis.
En.P.	Entopterygoid.
F.C.R.	Flexor carpi radialis.
F.F.	Flexor femoris.
F.S.	Flexor perforatus or sublimis.
G.	Gracilis.
G.H.	Genio-hyoglossus.
Gl.Md.	Gluteus medius.
Gl.Mx.	Gluteus maximus.
H.G.	Hyoglossus.
in.c.	Interarticular cartilage of knee-joint.

i.p.	Ischio-pubic ligament.
I.S.	Infraspinatus.
i.s.l.	Ilio-ischiatic ligament.
It.C.	Intertransversalis caudæ.
L.D.	Latissimus dorsi.
L.S.	Levator scapulæ.
N.	Neuro-mandibularis.
O.H.	Omohyoid.
P.	Pectoralis major.
Pc.	Pectineus.
P.M.	Platysma myoides.
P.P.	Peronæus primus.
P.R.b.	Pronator radii brevis.
P.R.l.	Pronator radii longus.
P.S.	Peronæus secundus.
P.T.	Pelvo-tibialis.
Py.	Pyriformis.
Q.F.	Quadratus femoris.
R.C.	Retractor cloacæ.
R.F.	Rectus femoris.
S.	Subscapularis.
S.A.^{1} & ^{2}	Serrati.
S.C.e.	Sterno-coracoidalis externus.
S.H.	Sternohyoideus.
S.H.^{1}	Sternohyoideus profundus.
S.L.	Supinator longus.
S.M.	Sterno-mastoid.
Sm.	Semimembranosus.
So.	Soleus.
S.P.	Serratus posticus.
Sp.C.	Sphincter cloacæ.
S.S.	Supraspinatus.
St.	Semitendinosus.
T.A.	Tibialis anticus.
Tr.e.	Triceps external head.
Tr.i.	Triceps internal head.
Tr.l.	Triceps long head.
Ts.M.	Teres minor.
Tr.P.	Transversus perinei.

January 20, 1874.

Prof. Newton, F.R.S., V.P., in the Chair.

Mr. Sclater exhibited two skulls of Baird's Tapir (*Tapirus bairdi*) which had been forwarded to him by Mr. Constantine Rickards of Oaxaca, Mexico, as obtained in that district, and which he had deposited in the Museum of the Royal College of Surgeons.

In one of them (2932 E of Mus. Cat.), in which the last molar teeth were not yet in place, the nasal septum characteristic of this Tapir was manifest, although not completely ossified; in the other the nasal bones and septum were unfortunately imperfect.

It appeared therefore certain that Baird's Tapir extended from Panama through Central America into Southern Mexico, and was probably the only species of this genus to be met with north of the Isthmus of Panama*.

Mr. Sclater also exhibited the horns of a male and female Arkar Sheep (*Ovis arkar*) transmitted to the Society by General Poltarski, Military Governor of Semipalatinsk. They were those of animals killed (the male in the winter of 1871 in the Altai, and the female in the autumn of 1872) about 60 versts from Semipalatinsk. General Poltarski had transmitted the skins of these fine sheep as well; but these had not arrived in a good state of preservation.

Mr. Sclater also exhibited the stuffed skin of one of two specimens of the Wild Ibex of Crete, presented to the Menagerie by Mr. Thomas B. Sandwith, H.B.M. Consul, May 21, 1873. In an article published in the Society's 'Proceedings' for 1872 (p. 689) and elsewhere, this species had been called *Capra picta*, Erhardt*. But there seemed to be little doubt, upon further examination, that the Wild Goat of Crete and the Cyclades, known since the days of the Odyssey†, was not really separable from *Capra ægagrus* (Pallas) of Western Asia. Mr. Busk had kindly examined the skull of the present specimen, and quite agreed with this identification. Blasius ('Säugeth. Europas,' p. 483) had spoken of the Wild Goat of Crete and the Cyclades as *Capra beden*, but without giving any authority for this statement.

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* See previous remarks on this subject, P. Z. S. 1867, p. 473.

Mr. Sandwith had furnished the following note on the occurrence of *Capra ægagrus* in Crete:—

"The Cretan Ibex is found on the slopes of Mount Ida and on the White Mountains, both of which attain a height of 8000 feet.

"Living amidst inaccessible rocks at an elevation of 4000 feet and upwards, they are seldom molested, being only occasionally shot by shepherds; and the island being free from beasts of prey, man is the only enemy they have to fear. The female sent to the Society's Gardens was procured from the White Mountains when a few weeks old; the two males were from Mount Ida, also taken when quite young. At first they were very wild, but soon grew tame, being fed chiefly on mulberry-leaves, and afterwards on barley and oats.

"Two of these animals have recently been sent to Berlin."

Mr. Edwin Ward, F.Z.S., exhibited two double hind feet of a Fallow Deer (*Cervus dama*), and read the following remarks:—

"Amongst a herd of about 150 Fallow Deer belonging to Lady Churchill, of Cornbury Park, Oxon, there has existed a doe possessing a malformation consisting of double hind feet.

"This doe has for several successive years dropped a fawn with the same malformation of double hind feet as her own.

"The keepers state that the doe had been served by different bucks each year. The hind feet of her progeny never differed, but always partook of the shape of the mother's.

"The division occurs in the upper part of the tarsus, which gradually diverges into two separate tarsi and two separate feet."

The following papers were read:—

1. On an apparently new Species of Parrot from Eastern Peru. By OTTO FINSCH, Ph.D., C.M.Z.S., &c., Curator to the Bremen Museum.

[Received November 29, 1873.]

PSITTACULA ANDICOLA, sp. nov.

Diagn. *Viridis unicolor, subtus dilutior; mento olivaceo-flavido; rostro canescenti-corneo.*

Description.—Upper parts beautiful dark grass-green, rump and upper tail-coverts somewhat brighter; the feathers on the occiput

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[*] See Rev. Cat. Vert. p. 90.

[†] See Odyssey, ix. 118 and 154.

and hind neck show under certain lights their tips shining olive-brownish yellow; front, lores and cheeks, and all the under surface yellowish grass green, brighter than the upper parts; crop and breast washed very faintly with olive; chin and upper part of throat changing into olive-yellow; quills dark grass-green, a little darker than the back; the primaries on the inner web sooty blackish, on the outer web dull greenish blue, with narrow but distinct green margins; the tectrices of primaries on the outer web towards the base also washed with dull blue; under wing-coverts grass green, like the vent; quills from beneath dull malachite-green like the under-surface of the tail-feathers, which from above are dark grass-green; the first primary beneath exhibits a narrow margin of olive-yellow. Bill horn-grey, with yellowish tip, mandible yellowish, with grey basal portion; feet and claws brownish.

Long. tot.	alæ.	rectr. intern.	rectr. ext.	culm.	Alt. rost.	Latid. rostr.	Long. tars.	dig. ext.
c. 6½″	4″ 1‴	2″ 4‴	2″	5‴	5½‴	4‴	5‴	6‴ (poll. Angl.).

Hab. Eastern Peru.

The specimen from which the above description was taken was collected by the well-known explorer of Peru, Mr. H. Whitely, at Paucartambo, a village east of Cuzco, in the Andes, at an elevation of 9400 feet. As I learn from a letter of Dr. Sclater, who kindly forwarded to me this specimen for inspection and description, Mr. Whitely unfortunately collected only this single specimen, which has no label of sex, but is certainly mature. The sexual differences are therefore still to be ascertained; and it seems to be possible that the male may exhibit a brighter coloration, although I incline to believe that both sexes will prove to be alike. In respect of the generic position, there can be no doubt, according to my views, that the species must be placed in the genus *Psittacula*, although there are some differences; but these show clearly that *Psittacula andicola* unites the true *Psittaculæ* of South America (*Ps. passerina*, *cœlestis*, &c.) with those usually distinguished under the generic term *Urochroma*, Bp. (*surda*, *melanonota*, &c.). From the latter it differs in the more rounded, although short, tail with more pointed feathers, as in the true *Psittaculæ*; besides, the tail-coverts are less elongated; the wings are quite the same as in the true *Psittaculæ*, but do not reach to the end of the tail, as in the members of the subgenus *Urochroma*. The bill much resembles that of *Psittacula*; but the lateral margins of the upper mandible show no emargination, and the bill in general is more bulky and corresponds rather with that of *Bolborhynchus*, Bp. (*B. monachus*, *aymara*, &c.), which, however, are easily distinguished by their long, cuneated tail-feathers. *Psittacula andicola* stands quite alone in its uniform green coloration, and cannot be confounded with any of its allies.

2. On a new Species of Fruit-Pigeon from the Pacific Island of Rapa or Opara. By Otto Finsch, Ph.D., C.M.Z S., &c., Curator to the Bremen Museum.

[Received November 30, 1873.]

Ptilonopus huttoni, sp. nov.

Diagn. *Major; pileo usque ad occiput pulchre violascenti-purpureo; macula mandibulari hinc inde violascenti-purpurea; mento pallide purpureo; capite reliquo, collo toto, guttureque virescenti-cinereis; macula pectorali magna obscure purpureo-violacea, lateribus viridibus; ventre crissoque obsolete flavis; subcaudalibus violacescenti-purpureis; dorso, tergo, uropygio, tectricibus alarum et caudæ olivaceo-viridibus; secundariis distinctius viridibus, pogonio externo anguste flavo marginato; scapularibus ultimis macula triangulari anteapicali lilacina; cauda obscure viridi, apice anguste albida; rostro plumbeo, apice flavido; pedibus flavescentibus.*

Front and crown of a beautiful purplish violet-red, as well as a patch at the base of the lower jaw; the chin, between the rami of the lower jaw, also red, but much paler than the crown; the red of the crown surrounded very indistinctly by a narrow line of green; occiput, nape, sides of head, neck, throat and crop ashy grey, washed faintly with green; the feathers on the throat and crop bifurcated, and dull olive-green on the centre, which gives these parts a more green appearance; middle of the upper part of throat pale yellowish, with the bases of the feathers white, forming an indistinct pale longitudinal patch just below the chin; breast covered by a very large patch of dark purplish violet, with dark olive-green at the base of feathers; sides of breast, vent, and flanks, and the upper part of vent dark olive-green; lower part of vent, anal region, and the hind part of thighs dirty yellow, with the base of the feathers white; under tail-coverts purplish violet-red, like the crown, with yellowish basal portion; feathered tarsus and under wing-coverts dark greenish ashy; back and upper parts dark olive grass-green; quills black on the inner web, on the outer web dark shining green, margined very narrowly with yellowish, which on the primaries is nearly invisible; apical portion of quills under certain lights with strong coppery reflections; tectrices of secondaries dark green, with broader and more distinct yellowish margins along the outer web; larger shoulder-coverts with a triangular spot of dull lilac; wing beneath blackish-grey; tail-feathers dark shining green, like the quills, on the inner web black, with a very narrow apical margin of yellowish white; under certain lights the margins of the outer web and the apical portion with coppery reflections; underside of tail blackish; bill horny-grey, with yellowish apical portion; feet pale (apparently yellow in the living bird) with horn-coloured nails; "eye pink" (collector's note).

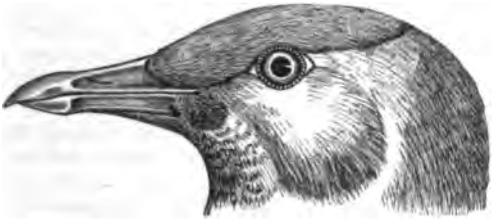
Long. tot.	alæ.	caud.	rostr. à front.	rostr. à rict.	tars.	dig. med.	ung.
12·20	6·70	4·90	·75	1·15	1·20	·95	·35 (poll. Angl.).

Hab. Island of Rapa or Opara, South Sea.

The unique specimen of this bird was forwarded to me through the kindness of my friend Capt. F. W. Hutton, now Professor of Natural History and Geology in the University of Otago, Dunedin, New Zealand, after whom I have the pleasure of naming it.

The specimen is marked in the collector's handwriting "*female.*" It may be expected that the male would exhibit a somewhat brighter coloration, although we know that in the members of the genus *Ptilonopus* the plumage of both sexes is nearly exactly alike.

Pt. huttoni is one of the most extraordinary *Ptilonopi* known. In the pattern of its coloration it shows some resemblance to *Pt. roseicapillus*, Less. (*Pt. purpureocinctus*, Gray), and *Pt. mercieri*, having, as in these species, a red spot on the base of the lower jaw; but it is easily distinguishable from all the other Polynesian Fruit-Pigeons by its pale purplish-red chin, and the extraordinarily large pectoral patch of dark purplish violet. But far more than by these peculiarities of colours, *Pt. huttoni* is distinguished by its large size and the unusually long and strong bill, as will be seen in the accompanying drawing of the head, of its natural size. The bill, indeed, differs very much from that of the typical *Ptilonopi*, and resembles rather that of the true *Columbæ*, but is still more elongated and slender. The first primary shows the peculiar attenuation on the terminal portion; and the two basal thirds of the tarsus are feathered, as in true *Ptilonopus*; the tail is proportionally longer, even at the end, and has 14 rectrices.



Head of *Ptilonopus huttoni*.

The island of Rapa, erroneously called on our maps Opara, is situated in 27½° S. latitude, and 144° W. longitude, about 700 miles S.E. of the Society group, and some 40° S. of the tropic of Capricorn, and as nearly as possible two thirds of the distance between Panama and Wellington. It was first discovered by the English navigator Vancouver, and is now under the protectorate of the French. During the time when a direct steamer-line was running from Panama to New Zealand, it was selected as a coal-station and port of call, possessing a harbour. A full account of the island has

[illegible]
Seemed that there were : ∴ . It must be trying for a fru pigeon!

been given by Captain John Vine Hall*, whose interesting and instructive paper may be referred to for further information.

In respect of animal life on Rapa, Capt. Vine Hall only tells us that wild goats are in abundance, as well as rats; of the birds he says only, "there are a few fowls wild in the bush, some widgeon, and of course sea-gulls;" but he does not mention pigeons. I am not aware whom we have to thank for the discovery of this remarkable *Ptilonopus*; but I think I am not wrong in suspecting that the specimen was obtained during the period when the Panama and New-Zealand line of steamers was running. This line was stopped some time ago; so that it will now be very difficult to get more specimens of this bird.

The geographical distribution of the Fruit-pigeons in the numerous islands of the Pacific is very interesting, and confirms the rule that insular regions produce a great quantity of species, peculiar in many cases to very small islands. Thus we find only *Ptilonopus perousii* generally distributed over the Central Polynesian island-groups, *i. e.* the Friendly, Navigators', and Feejee groups. *Pt. fasciatus*, Peale, is found on the Feejees, Navigators', and the small island Uea of the Wallis group. All the other groups possess their peculiar species:—the Friendly Islands, *Pt. porphyraceus*, Forst.; the Society Islands, *Pt. purpuratus*, Gmel., and *Pt. chrysogaster*, Gray; the Marquesas, *Pt. mercieri*, Des Murs, and *Pt. dupetitthouarsi*, Neboux; the Paumotu group, *Pt. coralensis*, Peale; the Hervey (Cook) Islands, *Pt. rarotongensis*, H. & F., and the very unsatisfactorily known *Pt. chalcurus*, Gray; the Pelews, *Pt. pelewensis*, H. & F.; the Mariannes, *Pt. roseicapillus*, Less.; the New Hebrides and New Caledonia, *Pt. grayi*, Gray, and *Pt. holosericeus*, Temm. Although some of these are nearly allied to each other, they are nevertheless valid species, which keep their distinctive characters always exact. At least, after a long acquaintance with most of them, I can declare that I have never found specimens which would lead to the belief that there exist intermediate forms between them. It must be remarked as a singular fact that in those island groups where two species occur, these are totally different and confined in their distribution to certain localities. Thus in the Society Islands we find *Pt. purpuratus* only on Tahiti, *Pt. chrysogaster* on Huaheine. As very prominent features in the geographical distribution of the genus *Ptilonopus* in the Pacific, we must further notice the total absence of Pigeons on the Sandwich Islands, and the occurrence of very peculiar species on certain remote and isolated islands. Thus the beautiful *Chrysœna victor*, Gould, is confined to Taviumi, one of the smallest islands of the Feejee group, whereas *Chrysœna luteovirens*, H. & J., lives in Viti-Levou and Ovalau, and now we learn that so small an island as Rapa produces one of the most remarkable species of the genus. In considering all these points we shall find it extremely difficult to explain what has caused such extraordinary phenomena in geographical distribution; and, to confess the truth, we must allow that we are still far off from understanding these questions satisfactorily, and that hypothesis only will serve us to answer them.

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* "On the Island of Rapa" in Trans. and Proceed. of the N. Z. Inst. vol. i. (1869), pp. 128–134.

3. Note on the Locality of *Oryx beatrix*.

By Major O. B. C. St. John, F.Z.S.

[Received December 3, 1873.]

In November 1864 I was at Maskat with Colonel Lewis Pelly, H.M.'s Resident in the Persian Gulf. Breakfasting at a country house of the Imam's, some five or six miles from the town, we were told that a rare animal, described as a wild cow, was kept there as a curiosity. On going into the yard where it was confined I recognized it at once as an Oryx, and from its pure white colour I supposed it to be a Leucoryx (*Oryx leucoryx*), in which idea I was strengthened by finding in an illustrated book of natural history that the habitat of that species is South Persia and Arabia. The specimen we were looking at, a full-grown female, was immediately offered for Colonel Pelly's acceptance, and was shortly afterwards sent by him to the Botanical Gardens at Poonah. It had been brought, I was told, from the country on the other side of the high mountains to the south of Maskat, which could not be reached under a week's camel-ride. As it is not, I believe, mentioned by any of the travellers in Central Arabia, it is probably confined to the comparatively fertile highlands of South-Eastern Arabia, the richest but least-known region of that country.

On visiting this Society's Gardens in 1867, on my return to England, I saw at once that the Leucoryx there exhibited from Western Africa was not identical with my Maskat specimen; nor was I able to find out to what species the latter should be referred. In 1869, being again in the Persian Gulf, I begged Colonel Pelly to obtain more specimens from Maskat, and, visiting him the next year, found that he had procured a pair. Of these the male, the horns of which were imperfect, was accidentally killed; and the female was sent to England[*]. There was little difference in size between the sexes, and, so far as could be seen, none in the length of horn. Both the animals were extremely tame, being allowed perfect liberty to wander about in the vicinity of Colonel Pelly's country house near Wushire.

Is there any Member of the Zoological Society at Aden who would make inquiries as to the occurrence of this Antelope in that part of Arabia?

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[*] See notice of the arrival of this animal, P. Z. S. 1872, p. 603.

4. On a new Species of *Pteropus* from Samoa.

By Edward R. Alston, F.Z.S.

[Received December 4, 1873.]

(Plate XIV.)

The Rev. Canon Tristram has kindly sent me for examination a small collection of Bats, which has been forwarded to him from Samoa by the Rev. S. J. Whitmee. It consists of four specimens preserved in spirits—one of *Emballonura semicaudata* (Peale)[*], two young examples of a *Pteropus*, apparently referable to *P. flavicollis*, Gray[†], and an adult male Fruit-Bat of a distinct species. After a careful investigation I believe this last to be an undescribed form, and have much pleasure in naming it (at Canon Tristram's suggestion) in honour of Mr. Whitmee, who has devoted much attention to the elucidation of the Samoan fauna.

Pteropus whitmeei, sp. n. (Pl. XIV.)

Face and cheeks dark grey, grizzled with yellowish hairs; crown of the head and occiput pale yellow; nape, sides of neck, and shoulders bright golden bay; back between the wings rich brown-black, rump slightly washed with rufous; chin black; lower surface of the body grizzled rufous, the shorter fur being brown and the longer hairs reddish yellow; limbs and flying-membrane dark brown; arms and thighs thinly clad both above and below with long hairs. Measurements:—

	in.
Length of head	2·15
„ ear	·85
„ forearm	4·45
„ thumb	1·45
„ first finger	3·15
„ second finger	7·35
„ third finger	6·05
„ fourth finger	5·45

Of the described species of Fruit-Bat, this is most nearly allied to *P. vitiensis*, Gray[‡], from the Feejees, of which it may probably be regarded as the Samoan representative; but it is at once distinguished from that species by its black back, by the totally different shade of the bay of the nape, and by the absence of the conspicuous yellow border across the shoulders. The present specimen is also considerably smaller than the type of *P. vitiensis* in the British Museum, and the first upper premolar is markedly larger. *P. samoensis*, Peale[§], is a much larger animal, and has the back uniform in colour with the lower parts.

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[*] *Vespertilio semicaudatus*, Peale, Zool. U.S. Expl. Exp. (1848), p. 23; *Emballonura fuliginosa*, Tomes, P. Z. S. 1859, p. 77 (*cf.* Peters, Monatsb. Akad. Berlin, 1867, p. 480).

[†] Catalogue of Monkeys, Lemurs, and Fruit-Bats (1870), p. 107.

[‡] Cat. Monkeys, &c. p. 109.

[§] Zool. U. S. Expl. Exp. p. 20.

5. List of the Species of *Fulgora*, with Descriptions of New Forms in the Collection of the British Museum. By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Received December 9, 1873.]

(Plate XV.)

Dr. Stål has very rightly restored the designation *Fulgora* to the group of Homopterous insects comprising the genus *Hotinus* of Amyot and Serville; this genus is confined to the Old World, most of the species occurring in the Eastern Archipelago.

The following list contains the whole of the species at present known to science, with descriptions of three beautiful new species in the National Collection; the number of species now amounts to twenty-eight.

Sect. 1. *Species with (when dead) orange wings.*

1. **Fulgora candelaria.**

Laternaria candelaria, Linnæus, Mus. Lud. Ulr. p. 153. n. 2; Act. Stockh. p. 63, pl. 1. figs. 1, 5, 6 (1746).

Fulgora candelaria, Linnæus, Syst. Nat. i. 2, p. 70. n. 33; Roesel, Ins.-Belust. 2, Loc. 189, pl. 30 (1749).

Flata candelaria, Germar, Mant. Ent. iii. p. 189. n. 1.

Pyrops candelaria, Spinola, Ann. Soc. Ent. France, viii. p. 233. n. 1 (1839).

Hotinus candelarius, Amyot & Serville, Hist. Nat. Hém. p. 490. n. 1.

Hong-Kong (*Bowring*); Cambodia. B.M.

2. **Fulgora cyanirostris.**

Fulgora cyanirostris, Guérin, Ann. Soc. Ent. France, 2nd ser. iii. Bull. Ent. p. 96.

Hotinus cyanirostris, Walker, List Homopt. Ins. ii. p. 265. n. 2 (1851).

Java.

3. **Fulgora brevirostris**, n. sp. (Plate XV. fig. 1.)

Closely allied to *F. candelaria*; tegmina black, with the nervures and spots bright ochreous, disposed as in *F. candelaria*; wings orange-ochreous, the apical third black; rostrum short, curved, ascending, testaceous, with paler spots; prothorax much compressed in front, with a central longitudinal ridge and two strongly impressed black punctures; testaceous, with a black lateral patch; the rest of the body luteous above, mesothorax maculated with black; abdomen below black, the margins of the segments testaceous; legs pitchy; the coxæ, and the femora of the last pair, dirty testaceous. Length of body, including rostrum, 1 inch 2 lines, rostrum 6 lines; expanse 2 inches 6 lines.

Penang (*Bowring*). B.M.

Perhaps a local race of *F. candelaria*, but unquestionably more distinct than *F. viridirostris* and *F. nigrirostris*. An example, labelled "India," from Mr. Saunders's collection, differs from the type in having the rostrum of a pitchy colour. The rostrum in this species is shorter than in *F. viridirostris*.

4. FULGORA VIRIDIROSTRIS.

Pyrops viridirostris, Westwood, Orient. Entom. pl. 3. fig. 4 (1848).

Hotinus viridirostris, Walker, List Homop. Ins. ii. p. 265. n. 3 (1851).

Assam (*Warwick*). B.M.

5. FULGORA NIGRIROSTRIS.

Hotinus nigrirostris, Walker, Ins. Saund. p. 29 (1858).

Pachebon (*Mouhot*). B.M.

6. FULGORA SPINOLÆ.

Fulgora spinolæ, Westwood, Ann. & Mag. Nat. Hist. ix. p. 118 (April 1842); Orient. Ent. pl 36. fig. 1 (1848).

Hotinus spinolæ, Walker, List Homopt. Ins. ii. p. 266. n. 4 (1851).

Silhet (*Stainsforth*, *Sowerby*, *Leadbeater*). B.M.

7. FULGORA LATHBURII.

Fulgora lathburii, Kirby, Trans. Linn. Soc. xii. p. 450. n. 97; Guérin, Icon. Règn. Anim. Ins. pl. 58. fig. 2.

Flata lathburii, Germar, Thom. Arch. ii. 2, p. 46 (1830).

Hotinus lathburii, Walker, List Homopt. Ins. ii. p. 266. n. 5 (1851).

Hong-Kong (*Bowring*). B.M.

Sect. 2. *Species with white wings.*

8. FULGORA CLAVATA.

Fulgora clavata, Westwood, Linn. Trans. xviii. p. 139. n. 7, pl. 12. fig. 1; Cab. Orient. Ent. pl. 3. fig. 1 (1848).

Hotinus clavatus, Walker, List Homopt. Ins. ii. p. 267. n. 12 (1851).

Silhet (*Stainsforth*); Assam (*Warwick*); N. India, E. India. B.M.

The rostrum of this insect has a perfectly ludicrous resemblance to a "vesuvian" cigar-light.

9. FULGORA PONDEROSA.

Hotinus ponderosus, Stål, Œfv. Kongl. Vetensk. Akad. Förhandl. xi. p. 244 (1854).

Hindostan, sp. ead.? B.M.

I believe this to be merely a faded specimen of one of the many varieties of *F. clavata*; we have an example from Silhet, and a second without a locality, which agree very fairly with Stål's description.

Sect. 3. *Species with red and whitish wings.*

10. FULGORA OCULATA.

Fulgora oculata, Westwood, Trans. Linn. Soc. xviii. p. 142. n. 13, pl. xii. fig. 5; Cab. Orient. Ent. pl. 36. fig. 2 (1848).

Hotinus oculatus, Walker, List Homopt. Ins. ii. p. 267. n. 9 (1851).

Malacca. B.M.

11. FULGORA SUBOCELLATA.

Fulgora subocellata, Guérin, Rev. Zool. (1839); Delessert, Souv. Voy. Inde, p. 66, pl. 16. fig. 1 (1842).

Hotinus subocellatus, Walker, List Homopt. Ins. ii. p. 267. n. 10 (1851).

Penang. B.M.

Possibly a variety of *F. oculata*.

12. FULGORA SULTANA.

Hotinus sultanus, Adams, Proc. Zool. Soc. 1847, p. 83; Ann. & Mag. Nat. Hist. xx. p. 204 (1847).

"Forest of Borneo near Tampasook," *A. Adams*; 'Corea' (*A. Adams*). B.M.

Mr. Walker states in his catalogue that our example is from Borneo. It is registered as from Corea with other insects from that locality; Borneo, however, is written upon the label attached to the specimen: the latter differs slightly from the example described.

13. FULGORA GIGANTEA, n. sp. (Plate XV. fig. 2.)

Closely allied to *F. sultana*, but altogether larger; corium of tegmina black, area beyond dirty testaceous; veins ochreous, base bright ochreous; two parallel series of transverse oval pale ochreous spots; ten or eleven indistinct ochreous spots with whitish zones beyond corium; wings with apical two fifths pitchy, paler at apex; basal three fifths rosy to centre, and then becoming pale testaceous to abdominal margin; rostrum reddish luteous above, bright testaceous at tip and below, rest of the body testaceous. Length of body, including rostrum, 2 inches; of rostrum 10 lines; expanse 4 inches 6 lines.

Sarawak (*Wallace*). B.M.

The example upon which I have founded the present species formerly stood in Mr. Saunders's Collection as the *Hotinus sultana* of White; it is, however, quite distinct; it is the largest species yet described.

Sect. 4. *Species with blue-green wings.*

14. FULGORA PYRORHYNCHA.

Fulgora pyrorhynchus, Donovan, Ins. Ind. Hom. pl. 7. fig. 1.

Hotinus pyrorhyncus, Walker, List Homopt. Ins. ii. p. 267. n. 8 (1851).

Fulgora pyrorhina, Westwood, Donov. Ins. Ind. 2nd edit. p. 13.

Fulgora rajah, Guérin, Rev. Zool. p. 183 (1839).

Nepaul (*Hodgson*). B.M.

15. FULGORA DUCALIS.

Hotinus ducalis, Stål, Trans. Ent. Soc. 3rd ser. vol. i. p. 576. n. 2 (1863).

Cambodia (*Mouhot*). Type, B.M.

16. FULGORA CŒLESTINA.

Hotinus cœlestinus, Stål, Trans. Ent. Soc. 3rd ser. vol. i. p. 576. n. 1 (1863).

Cambodia (*Mouhot*). B.M.

17. FULGORA MACULATA.

Fulgora maculata, Olivier, Enc. Méth. vi. p. 568. n. 5 (1791); Stoll, Cic. p. 98, pl. 26. fig. 143.

Flata maculata, Germar, Thon, Arch. ii. 2, p. 46 (1830).

Hotinus maculatus, Walker, List Homopt. Ins. ii. p. 266. n. 7 (1851).

Var. *Hotinus fulvirostris*, Walker, *l. c.* Suppl. p. 41 (1858).

Ceylon (*Paul & Cuming*). B.M.

18. FULGORA INTRICATA.

Hotinus intricatus, Walker, Journ. Linn. Soc. Zool. p. 142. n. 13 (1857).

Borneo; Sarawak (*Wallace*).

Attached to our specimen was a label, bearing the designation *T. tetrachroma*, Walker; but it appears to be a MS. name.

19. FULGORA STELLATA, n. sp. (Plate XV. fig. 3.)

Closely allied to *F. intricata*, Walker, darker in colour; the tegmina shorter, with more arched costal margin; the three basal bands broken up into ochraceous spots; wings deeper-coloured, the green area rather smaller. Length of body, including rostrum, 1 inch 8 lines, of rostrum 9 lines; expanse 3 inches 1 line.

Labuan (*Collingwood*). Two specimens, B M.

A third discoloured example from Mr. Saunders's cabinet is also in the Collection; like the discoloured examples of *F. maculata* (*Hotinus fulvirostris*, Walker), it has the wings pale testaceous at base; I suspect that all such specimens have come over in spirits.

20. FULGORA DELESSERTII.

Fulgora delessertii, Guérin, Rev. Zool. 183 (1839); Delessert, Souv. Voy. Inde, p. 66, pl. 16. fig. 2 (1842).

Malabar coast (*Ward*). B.M.

This species has a short and somewhat compressed rostrum.

Subgenus. *Rostrum much compressed from near base to apex.*

21. FULGORA GUTTULATA.

Fulgora (Pyrops) guttulata, Westwood, Ann. & Mag. Nat. Hist. ix. p. 119 (1842).

Fulgora (Hotina) guttulata, Westwood, Orient. Ent. pl. iii. fig. 3 (1848).

Pyrops guttulata, Walker, List Homopt. Ins. ii. p. 269. n. 4 (1851).

India. B.M.

The wings are bright green in fresh specimens, not cream-coloured, as in Westwood's figure.

22. FULGORA GEMMATA.

Pyrops gemmatus, Westwood, Cab. Orient. Ent. pl. 3. fig. 2 (1848).

Hotinus gemmatus, Walker, List Homopt. Ins. ii. p. 267. n. 13 (1851).

Darjeeling, N. India, E. India. B.M.

Sect. 5. *Species with scarlet wings.*

23. FULGORA COCCINEA.

Hotinus coccineus, Walker, List Homopt. Ins. Suppl. p. 42 (1858).

Ceylon (*Cuming*). B.M.

24. FULGORA DECORATA.

Fulgora decorata, Westwood, Trans. Linn. Soc. xviii. p. 141. n. 12, pl. xii. fig. 4 (1841).

Prolepta decorata, Walker, List Homopt. Ins. ii. p. 270. n. 2 (1851).

"Java" (*Westwood*).

Certainly not a *Prolepta,* but very close to the *Hotinus coccineus* of Walker.

25. FULGORA GUTTIFERA.

Hotinus guttifer, Stål, Œfvers. Vetensk. Akad. Förhandl. xv. p. 448. n. 1 (1859).

"Ceylon" (*Stål*); sp. ead.? Shanghai. B.M.

The description of this species is rather vague:—"tegminibus carneis, nigro conspersis, guttis compluribus minoribus anguste nigro-cinctis ornatis." It is difficult to imagine the colour of the *smaller* spots; in our insect they are *larger* than the black spots, orange, and edged with black.

26. FULGORA PYRRHOCHLORA.

Hotinus pyrrhochlora, Walker, MS.? *

Sarawak (*Wallace*). B.M.

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* Mr. Walker believes that he has described this species; but I have not succeeded in finding the description.

The same form as *F. virescens*, but the tegmina greener, with less numerous orange spots and with a yellow costal margin; wings scarlet. Length of body, exclusive of rostrum, 9 lines, of rostrum —?; expanse 2 inches 3 lines.

Sect. 6. *Species with pale greenish wings (subhyaline).*

27. FULGORA VIRESCENS.

Fulgora (Pyrops) virescens, Westwood, Ann. & Mag. Nat. Hist. ix. p. 119 (1842).

Fulgora (Hotina) virescens, Westwood, Orient. Ent. pl. iii. fig. 5 (1848).

Pyrops virescens, Walker, List Homopt. Ins. ii. p. 269. n. 5 (1851).

Hotinus semiannulus, Walker, List Homopt. Ins. Suppl. p. 42 (1858).

Cherra; N. India. B.M.

28. FULGORA CULTELLATA.

Hotinus cultellatus, Walker, Journ. Linn. Soc. Zool. i. p. 143. n. 14 (1857).

Borneo.

Seems allied to *F. virescens* of Westwood.

DESCRIPTION OF PLATE XV.

Fig. 1. *Fulgora brevirostris*, p. 97.
2. —— *gigantea*, p. 99.
3. —— *stellata*, p. 100.

6. A List of the Lepidopterous Insects collected by Mr. L. Layard at Chentaboon and Nahconchaisee, Siam, with Descriptions of new Species. By HERBERT DRUCE, F.L.S., F.Z.S.

[Received December 23, 1873.]

(Plate XVI.)

This collection is interesting because it contains several species that we have only previously known from the Malayan region. It appears that Chentaboon is a most prolific locality. It is a mountainous and thickly wooded district 200 miles from Bangkok, on the east coast of the Gulf of Siam. All the butterflies from this place were collected during the month of September 1872. Those from Nahconchaisee, a flat clayey district, 18 miles from Bangkok, covered with long yellow grass, were obtained during the last few months of 1872.

The collection contained seventy-nine species (six of which I have described as new), representing 4 families, 6 subfamilies, and 40 genera, of which 38 species are from Chentaboon, and 24 from Nahconchaisee, leaving 17 species common to both localities. The new species described are—*Euplœa layardi*, *Neptis noluna*, *Miletus irroratus*, *Cupido agnata*, *Ixias verna*, and *Taractrocera lineata*.

Family I. NYMPHALIDÆ, Westw.

Subfamily I. DANAINÆ, Bates.

Genus DANAIS, Lak.

1. D. LIMNIACE, Cram. (Pap. L.) Pap. Ex. i. t. 59 D, E (1779).
Chentaboon.

2. D. SIMILIS, Linn. (Pap. S.) Mus. Ulr. p. 299 (1764).
Nahconchaisee.

3. D. PLEXIPPUS, Linn. (Pap. P.) Mus. Ulr. p. 262 (1764).
Chentaboon.

4. D. MELANIPPUS, Cram. (Pap. M.) Pap. Ex. ii. t. 127 A, B (1779).
Chentaboon.

5. D. CHRYSIPPUS, Linn. (Pap. C.) Mus. Ulr. p. 263 (1764).
Nahconchaisee.

Genus EUPLŒA, Fabr.

1. E. PHŒBUS, Butler, P. Z. S. 1866, p. 270, n. 3.
Chentaboon. The type was from Penang.

2. E. CAMARALZEMAN, Butler, P. Z. S. 1866, p. 271, pl. xxix. f. 1.
Chentaboon.

3. E. MODESTA, Butler, P. Z. S. 1866, p. 273. n. 13.
Chentaboon and Nahconchaisee.

4. E. MÉNÉTRIESII, Feld. Wien, Ent. Mon. iv. p. 389. n. 15 (1860).
Chentaboon. One specimen.

5. E. SIAMENSIS, Feld. Reise Nov. Lep. ii. p. 341, t. 41. f. 6 (1867).
Chentaboon.

6. E. MARGARITA, Butl. P. Z. S. 1866, p. 279. n. 34.
Chentaboon. Two specimens.

7. E. MIDAMUS, Linn. (Pap. M.) Mus. Ulr. p. 251 (1764).
Chentaboon.

8. E. RHADAMANTHUS, Fab. (Pap. Rad.) Ent. Syst. iii. 1. p. 42, n. 127 (1793).
Chentaboon. One specimen.

9. E. LAYARDI, n. s. (Plate XVI. fig. 1.)

Upperside brown, paler round the outer margin, fore wing with two whitish spots at the end of the cell, and a double row of white spots round the outer margin. Hind wing with a band of oval-shaped white spots crossing it from the anal angle to the anterior margin, and a submarginal row of small white spots. Underside as above, except that all the white spots are plainer. Exp. 4 in.

Chentaboon. In Coll. H. Druce.

Subfamily II. SATYRINÆ, Bates.

Genus MELANITIS, F.

1. M. LEDA, Linn. (Pap. L.) Syst. Nat. i. 2. p. 773. n. 151 (1867).
Chentaboon. Three specimens.

Genus MYCALESIS, Hübn.

1. M. OTREA, Cr. Pap. Ex. ii. t. 314 A, B (1782).
Chentaboon.

2. M. LALASSIS, Hew. Ex. B. iii. *Myc.* t. 6. f. 35 (1864).
Nahconchaisee. One specimen.

Subfamily III. ELYMNIINÆ, Herr.-Schäff.

Genus ELYMNIAS, Hübn.

1. E. UNDULARIS, Drury, (Pap. Un.) Ill. Ex. Ent. ii. t. 10. f. 1, 2 (1773).
Nahconchaisee and Chentaboon.

2. E. LAIS, Cr. (Pap. L.) Pap. Ex. ii. t. 110 A, B (1779).
Nahconchaisee.

Subfamily IV. MORPHINÆ, Bates.

Genus AMATHUSIA, Fab.

1. A. PHIDIPPUS, Linn. (Pap. P.) Syst. Nat. i. 2. p. 752 (1769).
Chentaboon. One specimen.

Subfamily VIII. NYMPHALINÆ, Bates.

Genus CETHOSIA, Fab.

1. C. CYANE, Drury, (Pap. C.) Ill. Ex. Ent. i. t. 4. f. 1 (1773).
Chentaboon. One specimen. The smallest I have seen. Exp. 2 in.

Genus CIRROCHROA, Doubl.

1. C. LANKA, Moore, P. Z. S. 1872, p. 557.
Chentaboon.

2. C. FASCIATA, Feld. Reise Nov. Lep. iii. t. 49. f. 9, 10 (1867).
Nahconchaisee.

Genus MESSARAS, Doubl.

1. M. ERYMANTHIS, Drury, (Pap. E.) Ill. Ex. Ent. i. t. 15. f. 3, 4 (1773).
Chentaboon. Four specimens, all of which are very dark in colour.

Genus Atella, Doubl.

1. A. phalanta, Drury, (Pap. P.) Ill. Ent. i. 21. f. 1, 2 (1773).
Chentaboon and Nahconchaisee.

Genus Junonia, Hübn.

1. J. lemonias, Linn. (Pap. L.) Mus. Ulr. p. 277 (1764).
Chentaboon and Nahconchaisee.

2. J. laomedia, Linn. (Pap. L.) Syst. Nat. i. 2. p. 772 (1767).
Chentaboon and Nahconchaisee.

3. J. asterie, Linn. (Pap. A.) Syst. Nat. i. 2. p. 769 (1779).
Nahconchaisee.

Genus Ergolis, Boisd.

1. E. ariadne, Linn. (Pap. A.) Syst. Nat. i. 2. p. 778. n. 170 (1767)
Nahconchaisee.

Genus Neptis, Fab.

1. N. leucothoe, Cram. Pap. Ex. iv. t. 296 E, F (1782).

Chentaboon and Nahconchaisee. The Nahconchaisee specimens are very bright in colour.

2. N. clinia, Moore, P.Z.S. 1872, p. 563, pl. xxxii. f. 8.

Chentaboon and Nahconchaisee. The type was from Bengal.

3. N. hardonia, Stoll, (Pap. H.) Suppl. Cram. t. 33. f. 4, 4 D (1790).
Chentaboon.

4. N. nolana, n. s.

Upperside dark brown, all the bands and spots rufous orange. Anterior wing with a longitudinal band from the base to beyond the cell, with a broad band from the costal margin to the anal angle curved inwards and narrower in the middle, with a narrow band round the outer margin. Posterior wing crossed by three rufous-orange bands, the first and third narrow. Underside as above, only much paler in colour, with all the bands indistinctly marked.
Exp. 2¼ in.
Chentaboon. In coll. H. Druce.

Genus Athyma, West.

1. A. leucothoe, Linn. (Pap. L.) Mus. Ulr. p. 292 (1764).
Chentaboon, Nahconchaisee.

Genus Diadema, Boisd.

1. D. bolina, Linn. (Pap. B.) Mus. Ulr. p. 295 (1764).
Chentaboon, Nanconchaisee.

2. D. MISIPPUS, Linn. (Pap. M.) Mus. Ulr. p. 264 (1764).
Chentaboon.

Genus LEBADEA, Feld.

1. L. ISMENE, Doubl. Hew. Gen. D. L. t. 34. f. 2 (1850).
Chentaboon.

Genus ADOLIAS, Boisd.

1. A. LUBENTINA, Cram. (Pap. L.) Pap. Ex. ii. t. 155 C, D (1782).
Nahconchaisee. One specimen.

2. A. GARUDA, Moore, Cat. Lep. E. I. C. i. p. 186 (1857).
Nahconchaisee.

3. A. LEPIDEA, Butl. Ann. Nat. Hist. ser. 4, vol. i. p. 71 (1868).
Chentaboon.

Genus CHARAXES, Ochs.

1. C. ATHAMAS, Drury, (Pap. A.) Ill. Ex. Ent. i. t. 2. f. 4 (1773).
Chentaboon.

Family III. LYCÆNIDÆ.

Genus MILETUS, Hübn.

1. M. IRRORATUS, n. s.

Upperside dark glossy brown, with a whitish spot at the end of the cell of anterior wing. Underside very like *M. melanion*, Felder, but differs from it in having the light markings less clearly defined, and the white lines more indistinct.

Nahconchaisee. Coll. H. Druce.

Genus CUPIDO, Schrank.

1. C. ROSIMON, Fab. Syst. Ent. p. 523. n. 341 (1775).
Chentaboon and Nahconchaisee.

2. C. ETHION, Hew. Gen. D. L. t. 76. f. 3 (1852).
Nahconchaisee.

3. C. STRABO, Fab. Ent. Syst. iii. 1. p. 287 (1793).
Nahconchaisee.

4. C. AGNATA, n. s. (Plate XVI. figs. 2, 3, 4.)

Upperside (male) bluish white, with the outer margin of the anterior wing slightly dusky. Underside pale greyish brown, anterior wing crossed beyond the cell with six irregular white bands; posterior wing with eight, the first two close to the base; two black spots near the anal angle surrounded with orange. Upperside (female) bluish white, anterior wing with the apical half pale brown, broadest at the costal margin, posterior wing from the base to the apex brown, extending to the middle of the cell, outer margin brown, crossed by a band of white lunular markings, underside same as the male.

Exp. 1½ in.

Nahconchaisee. In coll. H. Druce.

Genus APHNÆUS, Hübn.

1. A. LOHITA, Horsf. (Amb. L.) Cat. Lep. E. I. C. p. 107. n. 39 (1829).
Chentaboon.

Genus SITHON, Hübn.

1. S. FRIGA, Fab. (Hesp. F.) Ent. Syst. iii. 1. p. 263. n. 19 (1793).
Chentaboon.

Genus MYRINA, Fab.

1. M. ATYMNUS, Cram. (Pap. A.) Pap. Ex. iv. t. 331 D, E (1782).
Chentaboon.

Genus DEUDORIX, Hew.

1. D. PETOSIRIS, Hew. Ill. D. L. p. 22, t. 9. f. 30, 31 (1863).
Chentaboon.

Genus CURITES, Hübn.

1. C. INSULARIS, Horsf. Cat. Lep. E. I. C. p. 125 (1829).
Chentaboon.

Genus AMBLYPODIA, Horsf.

1. A. CENTAURUS, Fab. (Pap. C.) Syst. Ent. p. 520 (1775).
Chentaboon and Nahconchaisee.

2. A. DIARDI, Hew. Cat. Lyc. B. M. p. 9. n. 43, t. 5. f. 41, 42 (1862).
Nahconchaisee.

Family IV. PAPILIONIDÆ.

Subfamily PIERINÆ, Bates.

Genus PONTIA, Fab.

1. P. XIPHIA, Fab. Spec. Ins. ii. p. 43. n. 180 (1781).

Chentaboon; Nahconchaisee. The specimens are very small.

Genus TERIAS, Swainson.

1. T. HECABE, Linn. Mus. Ulr. p. 249 (1764).
Nahconchaisee.

Genus PICRIS, Schrank.

1. P. JUDITH, Fab. (Pap. J.) Mant. Ins. ii. p. 22 (1789).
Chentaboon. One specimen.

2. P. NERISSA, Fab. (Pap. N.) Syst. Ent. p. 471. n. 123 (1775).
Nahconchaisee.

Genus TACHYRIS, Wall.

1. T. ALBINA, Boisd. Sp. Gén. i. p. 480 (1836).
Chentaboon.

Genus Delias, Hübn.

1. D. hierte, Hübn., var. indica, Wall. Trans. Ent. Soc. ser. iii. vol. iv. p. 351 (1867).
Nahconchaisee.

Genus Eronia, Hübn.

1. E. valeria, Cram. (Pap. V.) Pap. Ex. i. t. 85 A (1779).
Chentaboon.

Genus Callidryas, Boisd.

1. C. pyranthe, Godt. Enc. Méth. ix. p. 77 (1819).
Chentaboon; Nahconchaisee.

2. C. crocale, Cram. (Pap. C.) Pap. Ex. i. t. 55 C, D (1779).
Chentaboon; Nahconchaisee.

Genus Hebomoia, Hübn.

1. H. glaucippe, Linn. (Pap. G.) Mus. Ulr. p. 240 (1764).
Chentaboon; Nahconchaisee.

Genus Ixias, Hübn.

1. I. verna, n. s. (Plate XVI. figs. 5, 6.)

Upperside (male) yellowish white, with the base of the anterior wing greyish; apical half broadly black, bordered on the inner margin with bright yellow, with a large subapical orange band. Posterior wing, over the outer magin broadly black, extending from the apex to near the anal angle; abdominal margin sulphur yellow.

Underside the same as *I. pyrene*, Linn.

The female chiefly differs from the male in having all the dark margins much broader, and the subapical orange band smaller and paler-coloured. Underside the same as the male.

Exp. ♂ 2¼ in., ♀ 2 in.
Nahconchaisee. In coll. H. Druce.

Genus Ornithoptera, Boisd.

1. O. rhadamanthus, Boisd. Sp. Gén. i. p. 180. n. 8 (1836).
Chentaboon, 1 ♂; Nahconchaisee, 1 ♂.

Genus Papilio, Linn.

1. P. agamemnon, Linn. Mus. Ulr. p. 202 (1764).
Chentaboon.

2. P. erithonius, Cram. Pap. Ex. iii. t. 232 A, B (1782).
Nahconchaisee.

3. P. demolion, Cram. Pap. Ex. i. t. 89 A, B (1779).
Chentaboon.

4. P. polytes, Linn. Mus. Ulr. p. 186 (1764).
Chentaboon, 4 ♂, 3 ♀; Nahconchaisee, 2 ♂, 3 ♀.

5. P. CHAON, West. Arc. Ent. ii. t. 72. f. 1, 1* (1845).
Chentaboon, 4 ♂, 1 ♀.

6. P. CASTOR, Westw. Ann. Nat. Hist. ix. p. 37 (1824).
Chentaboon, 1 ♀.

7. P. MEMNON, Linn. Mus. Ulr. p. 193 (1764).
Chentaboon; Nahconchaisee.

P. MEMNON, var. ACHATES, Cram. Pap. Ex. iii. t. 243 A (1782).
Chentaboon.

8. P. DIPHILUS, Esp. Ausl. Schmett. t. 40 B. f. 1 (1785–1798).
Nahconchaisee, 1 specimen.

Family V. HESPERIDÆ, Leach.

Genus PAMPHILA, Fab.

1. P. MATHIAS, Fab. (Hesp. M.) Ent. Syst. Suppl. p. 433 (1798).
Nahconchaisee.

2. P. AUGIAS, Linn. (Pap. A.) Syst. Nat. i. 2. p. 794 (1767).
Nahconchaisee.

3. P. MARO, Fab. Ent. Syst. Suppl. p. 432 (1798).
Nahconchaisee.

Genus PLESIONEURA, Feld.

1. P. FOLUS, Cram. (Pap. F.) Pap. Ex. iv. t. 74. f. (1779).
Chentaboon.

Genus TARACTROCERA, Butler.

1. T. LINEATA, n. s. (Plate XVI. fig. 7.)

Upperside dark brown, fore wing with three minute cream-coloured spots near the middle on the costal margin, and a broken band of nine spots crossing the wing from near the apex to the inner margin. Posterior wing with four spots near the middle. Underside with all the nervules light cream-colour, and the spots as above.

Exp. 1 in.
Nahconchaisee. In coll. H. Druce.

Genus TAGIADES, Hübn.

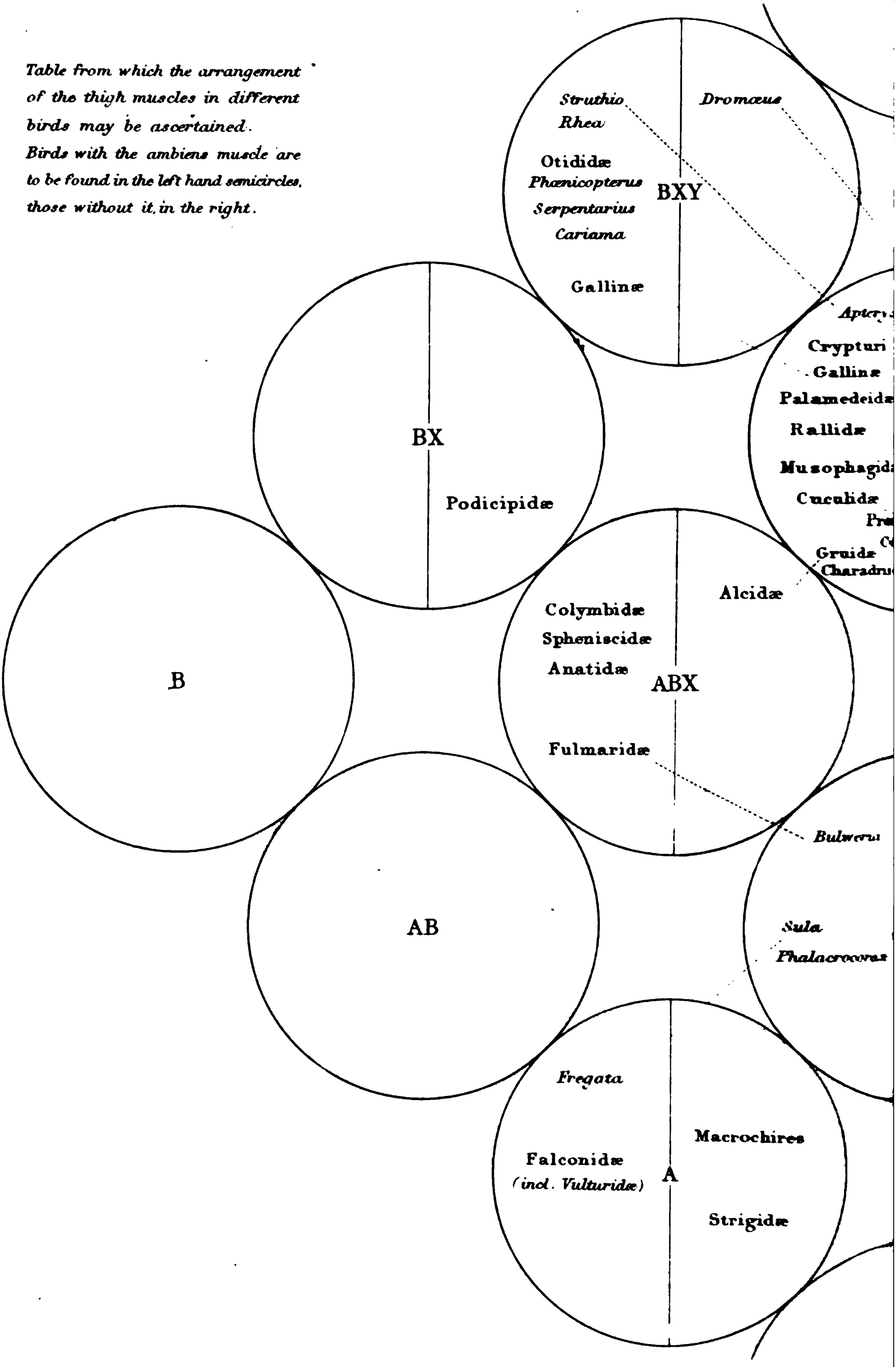
1. T. ADRASTUS, Cram. (Pap. A.) Pap. Ex. iv. t. 319 F, G (1782).
Nahconchaisee.

2. T. RAVI, Moore, P. Z. S. 1865, p. 779.

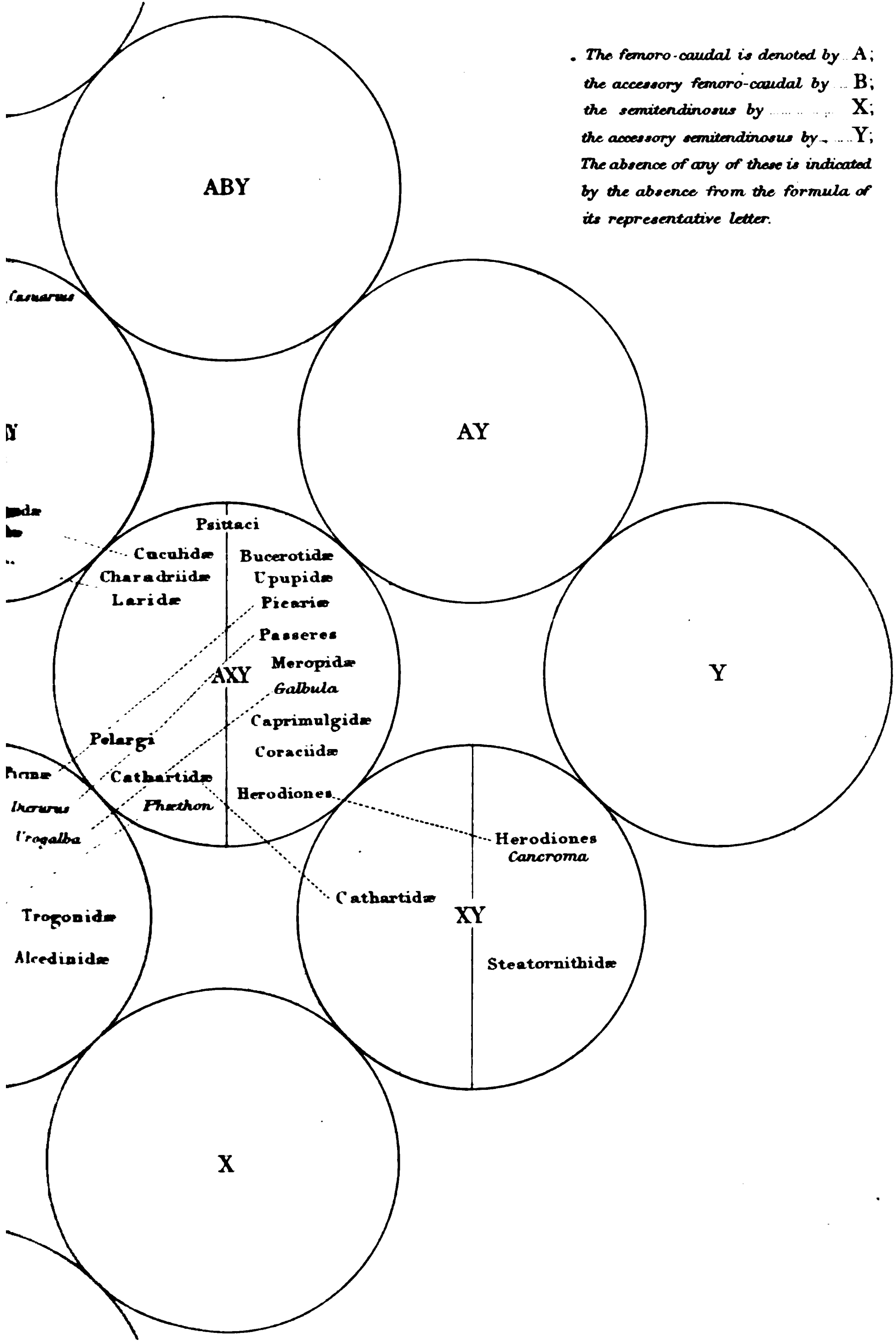
DESCRIPTION OF PLATE XVI.

Fig. 1. *Euplœa layardi*, p. 103.
2, 3, 4. *Cupido agnata*, p. 106.
Fig. 5, 6. *Ixias verna*, p. 108.
7. *Taractrocera lineata*, p. 109.

Table from which the arrangement of the thigh muscles in different birds may be ascertained.
Birds with the ambiens muscle are to be found in the left hand semicircles, those without it, in the right.



MYOLOGICAL F



The femoro-caudal is denoted by A;
the accessory femoro-caudal by B;
the semitendinosus by X;
the accessory semitendinosus by Y;
The absence of any of these is indicated by the absence from the formula of its representative letter.

Edwd Weller

ULÆ OF BIRDS

1. On certain Muscles of Birds and their Value in Classification. Part II. By A. H. Garrod, B.A., Fellow of St. John's College, Cambridge, Prosector to the Society.

[Received January 6, 1873].

(Plate XVII.)

The facts contained in the former part of this communication (P. Z. S. 1873, p. 626) being in an expanded form, it is not easy to appreciate their full significance at a glance, nor without considerable difficulty. To obviate this inconvenience I have constructed the following table, which is so arranged that by a very simple method, it is possible to tell without further reference which of the five muscles—the ambiens, the femoro-caudal, the accessory femoro-caudal, the semitendinosus, and the accessory semitendinosus—are present or absent. To obtain this result the names of the muscles themselves have been omitted, and single letters of the alphabet used in their stead.

The femoro-caudal is represented by	A
The accessory femoro-caudal	B
The semitendinosus	X
The accessory semitendinosus	Y

When these four muscles are present in a bird the formula A B. X Y expresses the fact; when any one is absent, that such is the case is indicated by the omission of the letter representing it. Thus the formula A. X Y indicates that the accessory femoro-caudal muscle only is absent; A B. X that the accessory semitendinosus is missing; A. X that the femoro-caudal and semitendinosus only are to be found; and A that the femoro-caudal alone is present. These formulæ may be termed myological formulæ. No bird is known in which all these four muscles are deficient.

In the accompanying diagram (Plate XVII.) all those birds which have the same myological formula are included together in one circle; and the circles are so placed in relation to one another that, if they were drawn on the surface of a sphere, there would be only a single operation of addition or subtraction necessary to move from any one to any of its immediate neighbours.

Of the four letters A, B, X, and Y the following are the sixteen possible combinations.

AB.XY	AB	*B.XY*	*XY*
AB.X	*A.X*	*B.X*	X
A B.Y	A.Y	B.Y	Y
A.XY	*A*	B	0

Those printed in *italics* are those which, if considered as myological formulæ on the nomenclature above given, have been found amongst birds; in other words, there are eight different types of muscular arrangement in the thighs of birds, as far as the four muscles now under consideration are concerned.

Each of the circles in the diagram is divided into two halves by a vertical line, so that the names of all those birds which are found to possess the ambiens muscle may be distinguished from those in which it is absent. The birds in which the ambiens is present are placed in the left-hand semicircles; those in which it is absent are to be found in the right-hand semicircles.

A few examples may illustrate the method of employing this table. Taking the *Musophagidæ*, for instance, they being found in the circle A B. X Y evidently possess all the four muscles—the femoro-caudal, the accessory femoro-caudal, the semitendinosus, and the accessory semitendinosus; and being on the left side, have also the ambiens. The *Strigidæ* being on the right side of the circle with the formula A, possess only the femoro-caudal, the ambiens being also absent; and so on. Those birds whose names appear partly in both semicircles may or may not possess the ambiens muscle in their different genera.

Before going further it will be necessary to show what degree of constancy is, as a rule, to be expected in the myology of birds. Respecting this point my experience is that individuals of a species agree precisely in their muscular arrangement. Many specimens of a considerable number of species have passed through my hands, and I have frequently dissected them one after another in order to detect, if possible, any individual variations; such, however, have not been forthcoming. It is true that in a single specimen of *Œdicnemus grallarius* the ambiens, instead of crossing the knee, ended on the inner side of the ligamentum patellæ; however, the muscle, though imperfectly developed, was undoubtedly there. The only other instance of an unexpected and abnormal individual structure was the presence in a specimen of *Pomatorhinus temporalis*, on one side only, of an accessory femoro-caudal, which I have not once seen in any other of at least 100 passerine birds that I have examined.

From these observations it is evident that individuals of a species all agree in the arrangement of the muscles of the thigh at least—so much so that any peculiarity observed in a specimen dissected for the first time may be taken to be characteristic of the species itself.

The same remarks apply to the species of a genus. Of several genera I have had the opportunity of dissecting many species, seven of *Bubo*, six of *Ardea* and *Columba*, five of *Buceros*, *Francolinus* and *Ibis*, four of *Chrysotis*, *Brotogerys*, and *Geopelia*, three of a large number, and two of many more. In all these genera the myology of the species does not vary, and its constancy is sufficient to justify the suspicion that when there are muscular differences between the species of an accepted genus, it is because genera have been combined which ought to be kept distinct. Such is evidently the case with *Conurus*, in which genus those without the red tail differ from those possessing it (*Pyrrhura*), the ambiens muscle being present in the former and absent in the latter. There are also other anatomical differences between them. The genus *Conurus*, therefore, as at present generally defined, is too extensive, and from it must be separated off the genus *Pyrrhura* of Bonaparte.

In *Euplocamus* there is an apparent slight exception to the uniformity in generic myology. In some species, as *E. erythrophthalmus*, *E. albocristatus*, and *E. horsfieldii*, the femoro-caudal is present, though very small indeed; in a specimen of *E. vieilloti*, however, it could not be found at all. This tendency to the entire disappearance of an almost obsolete muscle, however, can have but little weight in generalizations of the character under consideration.

Ascending to the next zoological grade, in the families of birds there may be myological differences, though in some, such as the Anatidæ, the Accipitres proper, the Strigidæ, and most of the smaller families, none have yet been found. The femoro-caudal is the muscle which seems to be the most susceptible of variation. Amongst the Cathartidæ it is present in *Cathartes* and absent in *Sarcorhamphus* and *Gyparchus*. Amongst the Gallinæ it is absent in *Pavo* and *Meleagris*, very small or absent as above mentioned in *Euplocamus*, and well developed in *Gallus* and *Argus*. The various genera of Columbæ and Psittaci may or may not possess the ambiens, as is the case with *Conurus* and *Pyrrhura* mentioned above. Amongst the Cuculidæ, the Ground-Cuckoos (*Centropus*, *Guira*, *Phœnicophaus*) differ from *Cuculus* and its allies in having the accessory femoro-caudal developed, whilst it is absent in the latter, their respective formulæ being A B. X Y and A. X Y. This peculiarity, when added to those in the pterylosis, justifies the division of the family into two subfamilies, which may be termed the *Centropodinæ* and the *Cuculinæ*. In the same way the *Pici* differ among themselves in possessing or being deficient of the accessory semitendinosus, *Picus* being one of the latter, whilst *Gecinus*, *Leuconerpes*, &c. are of the former.

It may be inferred from the above statements that in the families of birds, though there may be myological differences amongst the genera, these differences are never more considerable than such as consist of the absence of one muscle from the typical arrangement of the family, or, in other words, from the modification of one element of the typical formula. When, therefore, it is found that under any accepted arrangement there are subfamilies differing from one another by more than a single muscular peculiarity, there is reason to expect that these subfamilies would be further separated in a natural arrangement. The *Accipitres* furnish an example; the myological formulæ of its subdivisions are subjoined, + and — indicating the presence or absence of the ambiens muscle:—

Falconidæ A+
Vulturidæ A+
Cathartidæ A. X Y+ or X Y+
Strigidæ A—
Serpentariidæ B. X Y+.

This table makes it evident that the *Falconidæ* and *Vulturidæ* are widely separated from the *Cathartidæ* and the *Serpentariidæ*, and that it is perfectly impossible to unite in any intimate way these two latter families with the two former, or with one another. In fact the *Accipitres*, as generally defined, are not a natural group at all; and the *Cathartidæ* are not the least more nearly related to the *Vulturidæ* than to the *Falconidæ*.

Respecting families it may therefore be said that myological peculiarities which do not involve more than a single structural change from the typical arrangement of the family are frequent, and that further differences indicate a more distinct relationship.

The various opinions held by different ornithologists as to the correct division of the Orders of the Class Aves are so numerous that they make it impossible in this stage of the inquiry to discuss the myological features which they present. An inspection of Plate XVII. is sufficient to show that the formula of a bird is not of direct value in estimating ordinal characters.

Looking at the whole subject from another point of view, it may now be asked, What does the arrangement in the muscles above described teach as to the major divisions of the Class Aves? The remainder of this communication will be an attempt to answer this question.

A mere glance at Plate XVII. is sufficient to show that the facts disclosed by a study of the myology of birds do not, without extraneous assistance, place the different families in their true relationship to one another. Because the same muscles are present in two families of birds, it cannot therefore be said that their kinship is extremely close, or the reverse; if such were the case we should have to put the *Ardeidæ* with the Passeres, and to separate the Auks from the Gulls, both of which results would be strongly in opposition to the teaching of osteology. It is therefore necessary to look around to find, if possible, myological characters which have some definite relations to equally well-marked pterylographic, visceral, or osteological peculiarities.

Before going further it will be necessary to clearly understand a principle which is of much assistance in working out the details of classification from a large number of unarranged facts. It is this: when any certain structure is found to exist in an unmodified form in several clearly separable members of any well-marked larger division of the Animal Kingdom, that structure must be considered typical of the division; in other words, that structure, or the potentiality for producing it, must have existed in the common ancestor of the division under consideration; and those of its members who are wanting in the particular structure are so because they have lost it in process of time, not because the others have separately acquired it; for the probability, if it were only a matter of probability, is very little that several distinct and different species should separately acquire a single identical structure; whilst it is infinitely more likely that several distinct species should all lose a common character. That all Mammalia should acquire branched horns is improbable; but that many which possess branched horns should have them broken off whilst rushing through a wood, whatever species they belong to, is much more to be expected.

Employing this argument with regard to the facts under discussion, the ambiens muscle is present in many not closely related birds. It is found in genera so distant as *Struthio, Gallus, Musophaga, Cuculus, Anser, Aquila, Ciconia*, and *Thalassidroma*. This muscle must therefore be considered typical in birds; it, or the full potentiality for acquiring it in time, must have existed in the ancestral bird. Consequently those birds in which it is absent may be set down as having possessed the muscle in their ancestral form, as having lost it, and, what is more, as having lost all power ever to recover it—because the probability that exactly the same structure should be reproduced as the result of the influence of forces different from those by which it first originated, especially when acting on the body modified upon its previous condition, is infinitely little. I find no tendency to atavism in any structure once fully specialized. The modification of the tarso-metatarse of the Penguin cannot be included in the same category. The bird is hatched, as are others, with an incipient potentiality to develop separate metatarsals; a modification of its early nutrition, together with peculiarities in its habits of life, prevent the metatarsals from blending into a cylindrical bone; and so they take on a semi-ancestral form. Therefore, and nevertheless, the Penguin is no nearer the Reptilia than any other bird. It is a true bird, derived from the Avian ancestor only, which is the same thing as saying that it has no special Reptilian affinities, although its terrestrial and aquatic habits may have caused it to be acted on by forces somewhat similar, and therefore to appear, but only to appear, to have a somewhat similar conformation. The same argument applies to all the members of the class. The Ostrich and Tinamou are no nearer to reptiles than is the Sparrow or the Parrot; they are birds, and therefore they cannot be any thing else. However similar any individuals of two families which separated off two centuries ago and have never intermarried may be, no one thinks of claiming any nearer relationship for the similar individuals than for the other members of the families. Why then should it be said that some birds are Reptilian and others not? Reptiles and birds can never have interbred, therefore there can be no relationship between them.

To return to the subject. There are some families of birds, such as the *Columbæ* and the *Psittaci*, in which different genera vary in possessing or not having the ambiens muscle developed. Those in which it is absent must, from previous considerations, have lost it since the families differentiated off; and therefore those families may be classed with the others in which the ambiens is present. The *Columbæ* are further complicated in the same way with regard to the cæca of the intestine; some have cæca, others have not; they must evidently be classed with birds possessing cæca. And generally, if exceptions to a rule are found, when they are in the direction of the loss of any given structural peculiarity, such exceptions are not of much detriment to an argument if other conditions are favourable. But positive exceptions, such as the reappearance of a lost character in minor divisions in the major division of which it is supposed to be absent, are not to be allowed under any consideration whatever.

For nearly the last two years I have been on the watch for a structural character or a combination of characters to turn up which would give clear indications of the most important divisions of the bird class. My search has, to my own mind, been fairly satisfactory in its results; for the classification at which I have arrived appears to have a practicability about it which is decidedly promising.

The oft-named ambiens muscle is, in my idea, the key to the whole. In some families it is present, in others absent. By combining all those in which it is found into one subclass, to be subsequently termed *Homalogonatæ* (typically kneed, because the ambiens runs in the tendon of the knee), and all those in which it is absent into a second, to be subsequently termed *Anomalogonatæ* (abnormally kneed), a primary division is the result which the following facts will in great measure justify. It may be stated at once, however, that there are a few undoubtedly homalogonatous birds in which the ambiens muscle is absent; there cannot be any anomalogonatous birds in which it is present.

The following table (Table I.) contains the names of the various most important divisions of the Class of Birds, arranged according as they are homalogonatous or anomalogonatous. Those homalogonatous divisions with an asterisk (*) against them do not possess the ambiens muscle in any of their genera; in those with a dagger (†) it is wanting in certain genera only.

TABLE I.

Class **AVES.**
Subclass HOMALOGONATÆ.
Order I. GALLIFORMES.
Cohort (α) STRUTHIONES.
Family 1. STRUTHIONIDÆ.
Subfamily 1. *Struthioninæ.*
„ 2. *Rheinæ.*
Family 2. CASUARIIDÆ (*).
„ 3. APTERYGIDÆ.
„ 4. TINAMIDÆ.
Cohort (β) GALLINACEÆ.
Family 1. PALAMEDEIDÆ.
„ 2. GALLINÆ.
„ 3. RALLIDÆ.
„ 4. OTIDIDÆ.
Subfamily 1. *Otidinæ.*
„ 2. *Phœnicopterinæ.*
Family 5. MUSOPHAGIDÆ.
„ 6. CUCULIDÆ.
Subfamily 1. *Centropodinæ.*
„ 2. *Cuculinæ.*
Cohort (γ) PSITTACI (†).

Order II. ANSERIFORMES.
Cohort (α) ANSERES.
Family 1. ANATIDÆ.

Family 2. SPHENISCIDÆ.
„ 3. COLYMBIDÆ.
„ 4. PODICIPIDÆ (*).
Cohort (β) NASUTÆ.
Family 1. PROCELLARIIDÆ (†).
„ 2. FULMARIDÆ.
Subfamily 1. *Fulmarinæ.*
„ 2. *Bulweriinæ.*
Order III. CICONIIFORMES.
Cohort (α) PELARGI.
„ (β) CATHARTIDÆ.
„ (γ) HERODIONES (*).
„ (δ) STEGANOPODES.
Family 1. PHAETHONTIDÆ.
„ 2. PELECANIDÆ.
„ 3. PHALACROCORACIDÆ.
„ 4. FREGATIDÆ.
Cohort (ε) ACCIPITRES.
Family 1. FALCONIDÆ.
„ 2. STRIGIDÆ (*).
Order IV. CHARADRIIFORMES.
Cohort (α) COLUMBÆ (†).
Family 1. COLUMBIDÆ.
„ 2. PTEROCLIDÆ.
„ (β) LIMICOLÆ.
Family 1. CHARADRIIDÆ.
„ 2. GRUIDÆ.
„ 3. LARIDÆ.
„ 4. ALCIDÆ (*).

Subclass ANOMALOGONATÆ.
Order I. PICIFORMES.
Family 1. PICARIÆ.
Subfamily 1. *Picidæ.*
„ 2. *Ramphastidæ.*
„ 3. *Capitonidæ.*
Family 2. UPUPIDÆ.
„ 3. BUCEROTIDÆ.
„ 4. ALCEDINIDÆ.
Order II. PASSERIFORMES.
Family 1. PASSERES.
„ 2. BUCCONIDÆ (†).
„ 3. TROGONIDÆ.
„ 4. MEROPIDÆ.
„ 5. GALBULIDÆ.
„ 6. CAPRIMULGIDÆ.
„ 7. STEATORNITHIDÆ.
„ 8. CORACIIDÆ.
Subfamily 1. *Coraciinæ.*

Subfamily 2. *Momotinæ.*
„ 3. *Todinæ* (?).

Order III. CYPSELIFORMES.
Family Macrochires.
Subfamily 1. *Cypselinæ.*
„ 2. *Trochilinæ.*

There are peculiarities in the arrangement of the cæca of the intestine and of the tuft of feathers on the oil-gland which are correlatable with this presence or absence of the ambiens muscle. Some birds possess cæca to the intestine at the same time that the oil-gland is tufted (1); others have cæca and a nude oil-gland (2), others a tufted oil-gland and no cæca (3), whilst a few have no cæca and a nude oil-gland (4); the genera *Didunculus*, *Goura* and *Treron* amongst the *Columbæ*, have no cæca and no oil-gland, wherein they differ from all other birds. Now it is a curious fact that it is only amongst the homalogonatous birds that the first of the above-named conditions is found, namely a tufted oil-gland combined with cæca to the intestine; and what is more, they nearly all agree with it. The following table (II.) contains the names of those birds in which a tufted oil-gland is combined with cæca to the intestine, an asterisk indicating the families in which there are certain exceptions.

Table II.

Struthiones *.
Crypturi.
Gallinæ *.
Otidæ *.
Phœnicopteridæ.
Palamedeidæ.
Rallidæ.
Limicolæ.
Laridæ.
Alcidæ.
Gruidæ.
Anatidæ.
Spheniscidæ.
Colymbidæ.
Procellariidæ *.
Ciconiidæ.
Ardeidæ (one cæcum).
Steganopodes.
Falconidæ.
Vulturidæ.

Respecting the exceptions, it may be mentioned that the *Struthiones* and *Otis* have no oil-gland; but as in their nearest allies it is tufted, they may be included amongst those in which it is so also. Amongst the *Gallinæ* I have always found the oil-gland nude in the *Megapodidæ* (*Talegalla* and *Megacephalon*). The Storm-Petrels have no cæca, and the *Ardeidæ* have only one.

It is therefore evident that from the whole list of birds termed homalogonatous, only the *Musophagidæ, Psittaci, Columbæ, Cuculidæ,* and *Cathartidæ* are exceptions to the above-stated rule, the first two having no cæca, the next two a nude oil-gland, and the last neither cæca nor a tufted oil-gland.

Another myological fact comes in here to assist. A reference to Plate XVII. in comparison with Table I. will show that no anomalogonatous bird has been found to possess the accessory femoro-caudal; that is, B never enters into its myological formula. Such being the case, when a bird has a formula with B in it, at the same time that either the ambiens muscle is absent, or has a nude oil-gland in combination with intestinal cæca, it is certain to be a homalogonatous bird. That the formula of the *Musophagidæ* is A B. X Y, and the ambiens is present, therefore more than counterbalance the exception presented by the arrangement of their cæca and oil-glands. The same remarks apply to the *Cuculidæ*. The *Cathartidæ* possess the ambiens, which, in conjunction with many other Ciconiine characters, leaves no doubt about their position; and the *Psittaci* cannot, from the presence of an ambiens in some of them, be placed with the Anomalogonati, to which they otherwise present many points of similarity.

Excluding the *Macrochires*, which have a nude oil-gland and no cæca, all the other anomalogonatous birds have either a nude oil-gland and cæca, or a tufted oil-gland and no cæca; and this definite set of features makes it easy to divide them up into two main orders, the Piciformes and the Passeriformes.

Piciformes,
with tufted oil-gland and no cæca.
Pici.
Capitonidæ.
Ramphastidæ.
Upupidæ.
Bucerotidæ.
Alcedinidæ.

Passeriformes,
with nude oil-gland and cæca.
Passeres.
Bucconidæ (?).
Trogonidæ.
Meropidæ.
Caprimulgidæ.
Steatornithidæ.
Coraciidæ.
Momotidæ.

The position of the Macrochires is uncertain. In so far as the mouth tends to get very broad it resembles some of the Passeriformes.

As before remarked, none of the Anomalogonatæ possess the accessory femoro-caudal muscle. In them also the posterior margin of the sternum is more perfectly formed than in the Homalogonatæ. Scansorial feet are found in both divisions; but whilst those of the Parrots and Cuckoos exhibit a similar arrangement of the tendons of the toes, the Toucans, Woodpeckers, and Jacamars follow a quite different type.

All the birds which present the palatal characters expressed by Prof. Huxley's term Schizognathous, and the nasal characters expressed by my term Schizorhinal, are homalogonatous. All non-struthious birds with a truncated vomer are anomalogonatous.

As to what appear to me to be the main divisions of the homalogonatous birds, the myology of the thigh does not give more than a certain amount of assistance. In list I. it will be seen that large brackets precede the names of the smaller divisions or families, separating them into what to me are worthy of the dignity of orders. From these it is evident that I would divide homologonatous birds into four orders, I. Galliformes, II. Anseriformes, III. Ciconiiformes, and IV. Charadriiformes (Schizorhinæ). These must be considered separately.

The Galliformes include all the birds in which there is any approach in structure to the common Fowl. With the exception of the *Psittaci* (which in other points also are peculiar), and the *Cuculinæ* from amongst the Cuculidæ, they all possess the accessory femoro-caudal (B) well developed. The semitendinosus (X) and the accessory semitendinosus (Y) are always present, and, except in *Casuarius*, *Dromæus*, and some *Psittaci*, the ambiens is to be found well developed.

The presence of both the accessory femoro-caudal and the accessory semitendinosus (that is, of both B and Y in their myological formula) is the most characteristic feature which they have in common, giving the formula B. X Y as typical.

The Anseriformes include most of the web-footed birds. Their most marked characteristic is the presence of the accessory femoro-caudal (except in *Bulweria*), whilst the accessory semitendinosus is absent, except in the Storm-petrels. With the exception of the *Podicipidæ*, the femoro-caudal is present; so that their formula is nearly always A B. X. Excluding *Podiceps* and a Storm-petrel in the case of one specimen examined, I have always found the ambiens present.

The Ciconiiformes are less easily defined than the other groups. The cæca coli are never long; the accessory femoro-caudal is never present; and the obturator externus is frequently more developed than in other birds, to replace it in action. It is in the pectoral region that these birds most closely agree. The strong short anterior costo-coracoid ligament, the bowed space between the superior margin of the second pectoral muscle and the furcula, and the frequently complicated arrangement of the great pectoral, whereby it is developed in a superficial and a deep layer (in which, by the way, the *Procellariidæ* agree with them), all point to a not far distant relationship. The *Ardeidæ* are the most aberrant of the order, the ambiens muscle being always absent in them at the same time that there is only one colic cæcum.

The Charadriiformes correspond to the Schizorhinæ, so named by me on account of a peculiarity in the structure of the nasal bones, which is sufficiently special in my estimation to justify the separation of all those birds in which it is found into a single order by themselves. There are considerable myological differences amongst its families according to their habits, the only uniform character being the presence of the femoro-caudal muscle. The ambiens is absent in the *Alcidæ* (*Alca*, *Uria*) and some *Columbæ*.

The minor divisions of the orders above defined must now engage our attention.

The order GALLIFORMES may be divided into three main divisions or cohorts—α. the *Struthiones*, β. the *Gallinaceæ*, and γ. the *Psittaci*.

α. The *Struthiones* are peculiar in the structure of the palate; and in them the sciatic nerve and artery always perforate the fibres of the accessory femoro-caudal in a manner not found in any other birds.

They are divisible into four families, the first three of which have no oil-gland:—

1. *Struthio* and *Rhea*, which form each the type of a separate subfamily. In common they have the formula B. X Y, the ambiens muscle present, and long sacculated cæca coli, which in *Struthio* are

situated peculiarly far from the cloaca. There is no aftershaft to the contour feathers. *Struthio* has two carotids, *Rhea* only the left.

2. The genera *Casuarius* and *Dromæus*. They have the formula A B. X Y and B. X Y respectively. The ambiens muscle is absent, the cæca coli are short, and there is a very large aftershaft to the contour feathers. There are two carotid arteries.

3. *Apteryx*, in which there is an extra femoro-caudal muscle, the formula otherwise being A B. X Y. The ambiens is large; the cæca coli are well developed; and there is only one carotid, the left.

4. The *Crypturi*, with a formula A B. X Y. The ambiens muscle is large; the cæca coli are well developed; and an oil-gland is present, well tufted. The aftershaft may or may not be present on the contour feathers.

β. The *Gallinaceæ* all comprise B. X Y in their formula; the ambiens is present in all; and except in the *Musophagidæ* there are always cæca to the intestine.

They are divisible into six families:—

1. The *Palamedeidæ*, with formula A B. X Y, the ambiens present, cæca sacculated as in *Struthio* and *Rhea* only, two carotid arteries, no aftershaft or a very small one, and a tufted oil-gland.

2. The *Gallinæ*, with formula A B. X Y or B. X Y. The ambiens is always present, as are cæca coli, an aftershaft, and a third pectoral muscle beneath the second; the oil-gland may be strongly tufted, or the tuft may be very weak; in the *Megapodidæ* it does not exist. The second pectoral is very long; and there is a characteristic shape about the sternum. In the *Megapodidæ* there is only one carotid, the left; in all the others both are present. Neither *Turnix* nor *Pterocles* are included in this family.

3. The *Rallidæ*, with formula A B. X Y, the ambiens and cæca present, two carotids, an aftershaft, a tufted oil-gland, and a characteristic sternum. *Parra* is not included.

4. The *Otididæ*, including the *Otidinæ*, *Œdicnemus*, *Serpentarius*, and *Cariama* (and perhaps the next genus, *Phœnicopterus*). The formula is B. X Y; the ambiens and cæca are present, as is the aftershaft; there are generally two carotids, though in *Otis denhami* the right only is present, and in *Tetrax* the left; the oil-gland when present, as in all but *Otis*, is tufted, except in *Cariama* and *Chunga*.

5. The *Musophagidæ*, with formula A B. X Y, an ambiens muscle, two carotids, an aftershaft, a tufted oil-gland, and no cæca.

6. The *Cuculidæ*, with an ambiens muscle, two carotids, nude oil-gland, and cæca. They form two subfamilies:—

The *Centropodinæ*, or Ground-Cuckoos, with formula A B. X Y.

The *Cuculinæ*, or true Cuckoos, with formula A. X Y.

γ. The cohort *Psittaci* presents in many points intermediate characters between the homalogonatous and the anomalogonatous birds. With a constant formula A. X Y, no cæca or gall-bladder, an oil-gland tufted or absent, the ambiens may or may not be present, and the carotids may exhibit peculiarities in their arrangement*.

The order ANSERIFORMES may be divided into two cohorts—α. the *Anseres*, β. the *Nasutæ*.

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* See P. Z. S. 1873, p. 465.

α. The *Anseres* include four families, (1) the *Anatidæ*, (2) the *Spheniscidæ*, (3) the *Colymbidæ*, and (4) the *Podicipidæ*. With the exception of the Podicipidæ, they agree in having a formula A B. X, an ambiens muscle, cæca to the intestine (except *Mergellus*, in which there is only one small cæcum), two carotids, a very elongate great pectoral muscle, which meets its fellow of the opposite side above the symphysis furculæ in a median raphe, and a tufted oil-gland. The *Podicipidæ* have for formula B. X; the ambiens is absent, as is frequently the semimembranosus; the left carotid only is present; there are cæca coli and a tufted oil-gland.

β. The *Nasutæ*, including the Storm- and true Petrels. I have not dissected *Diomedea*. They are divisible into two subfamilies:—

1. The Storm-petrels, with formula A B. X Y, no cæca, a tufted oil-gland and a peculiar sternum. The ambiens does not seem to be always developed. The great pectoral is double.

2. The *Fulmaridæ*, with formula A B. X, the ambiens muscle present, two short cæca, a tufted oil-gland, and a characteristic sternum. *Bulweria* is exceptional in having its formula A. X, and therefore quite different from that of the Storm-Petrels. The great pectoral is double.

The order Ciconiiformes may be divided into five cohorts of somewhat different importance:—

1. The *Pelargi*, with formula A. X Y, an ambiens muscle, a tufted oil-gland, intestinal cæca, and a double great pectoral muscle.

2. The *Cathartidæ*, with formula A. X Y, an ambiens muscle, no cæca, a nude oil-gland, and a double great pectoral muscle.

3. The *Herodiones*, with formula A. X Y or X Y, no ambiens muscle, a single cæcum coli, and a tufted oil-gland.

4. The *Steganopodes*, which do not form so natural a family, in my eyes, as in those of many; for their myological formula is not the same in all, being

In *Phaethon* A. X Y,
In *Sula* and *Phalacrocorax* A. X,
In *Fregata* A,

from which it may be inferred that *Phaethon* approaches the Ciconiidæ and *Fregata* the Accipitres. They all possess the ambiens, cæca, a tufted oil-gland, and the four toes included in a web, which is but imperfectly developed in some. *Sula* and *Phalacrocorax*, with *Plotus*, form one family, *Phaethon* another, *Fregata* a third, and *Pelecanus* a fourth.

5. The *Accipitres* proper include the Falconidæ and the true Vultures (between which there is not even any subfamily structural difference), together with the Strigidæ. Their formula is A; the ambiens is present (except in the Strigidæ), as are cæca, a tuft to the oil-gland, and an aftershaft (except in *Pandion*).

The order Charadriiformes, including all the Schizorhinal birds, is a large one, and may be divided into two cohorts—*α*. the *Columbæ*, and *β*. the *Limicolæ*. They all, except *Arctica alle*, have two carotids.

α. The *Columbæ*, including the *Pteroclidæ*, have a formula A B. X Y (except in *Lopholamus*, in which it is apparently A. X Y). The ambiens muscle is sometimes present, sometimes absent. The oil-gland, if present, is nude; cæca may or may not be present; and the pterylosis is a very diffused one.

β. The *Limicolæ* have a tufted oil-gland and cæca; they form four families at least:—

1. The *Charadriidæ*, with formula A B. X Y and A. X Y, and an ambiens muscle.
2. The *Laridæ*, with A. X Y formula, and an ambiens muscle.
3. The *Gruidæ*, with formula A B. X Y, and an ambiens muscle.
4. The *Alcidæ*, with formula A B. X, and no ambiens muscle.

The ANOMALOGONATOUS birds form three cohorts—*α*. the *Passeriformes*, *β*. the *Piciformes*, and *γ*. the *Cypseliformes*. They are divisible into the following families:—

α. *Passeriformes*.

1. The *Passeres*, with a formula A. X Y (except in *Dicrurus*, in which it is A. X), a characteristic palate and sternum (except in *Pteroptochus*), a left carotid only, and a characteristic *tensor patagii brevis* muscle (to be described on a future occasion).
2. The *Bucconidæ*, of which I have not dissected any example, but which most probably come here.
3. The *Trogonidæ*, with formula A. X, a left carotid only, and a very passerine pterylosis.
4. The *Meropidæ*, with a formula A. X Y, and a left carotid only.
5. The *Caprimulgidæ*, with a formula A. X Y, and two carotids.
6. The *Steatornithidæ*, with a formula X Y, and two carotids.
7. The *Coraciidæ*, in which the *Coraciinæ* and *Momotinæ* are combined, on account of their not presenting family differences. They have a formula A. X Y, and two carotids.
8. The *Galbulidæ*, with a formula A. X Y or A. X, two carotid arteries, and a scansorial foot.

β. *Piciformes*.

1. The *Picariæ*, to include the *Pici*, the *Ramphastidæ*, and *Capitonidæ*, these three not in any point presenting family differences. They may be divided into two subfamilies, the *Pici* forming the one, the *Ramphastidæ* together with the *Capitonidæ* forming another. The formula is A. X Y (except in the *Picinæ* among the *Pici*); the form of the sternum and of the tensor patagii brevis is characteristic. The foot is scansorial.
2. The *Upupidæ*, with formula A. X Y, a characteristic pterylosis, a left carotid only, and a passeriform foot.
3. The *Bucerotidæ*, with formula A. X Y, no fat found on the body, a characteristic sternum, and one or two carotids.
4. The *Alcedinidæ*, with formula A. X, and two carotids.

γ. *Cypseliformes*, including the *Cypselidæ* and *Trochilidæ*, between which the differences are only of subfamily importance. The formula is A; the tensor patagii brevis and the pterylosis are characteristic, as is the sternum; and there is only a left carotid (except in *Cypseloïdes*).

2. Notes on Entozoa. Part II. By T. Spencer Cobbold, M.D., F.R.S., F.L.S., Lecturer on Parasites at the Middlesex Hospital Medical College.

[Received January 2, 1874.]

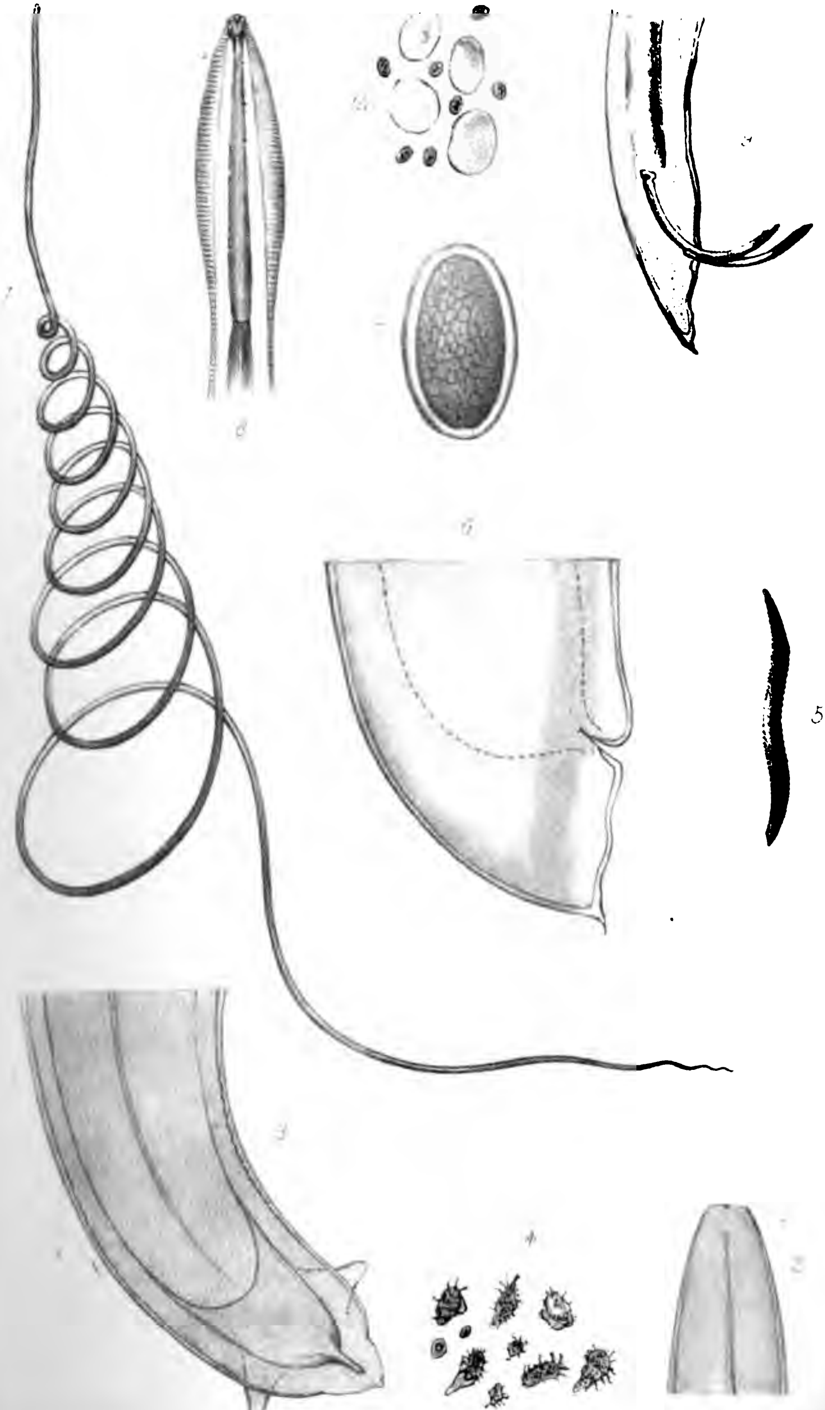
(Plate XVIII.)

Whilst engaged in writing the concluding portion of my first set of "notes," I received for examination a nematode parasite, some brief account of which will appropriately commence the present series.

4. Filaria gracilis, Rud. (Plate XVIII. figs. 1–4.)

On the 20th of August, 1873, Mr. Samuel Smith, M.R.C.S., of Clifton, transmitted an example of this entozoon, with a request that I would identify it. Finding that the specimen was a male, and unaware that the males of this species ever attained a length of 20 inches, I at first supposed that we had to deal with a new form. However, on subsequently analyzing its characters, I became satisfied that the worm was really only an unusually fine male *F. gracilis*. The frequency of the occurrence of this nematode in the abdominal cavity and other parts of the trunk of Monkeys is a matter of common observation. I remounted no less than four preparations, representing numerous examples of this Worm, for the Museum of the Royal College of Surgeons. Some of the Hunterian specimens were originally obtained by Professor Owen from the cavity of the pleura of a Capuchin Monkey, others having been removed by him from the thorax of an Orang-outang. From Mr. Smith I have learnt that the present example formed one of a group of five Worms, all of which were found lying between the folds of the omentum of a Spider Monkey (*Ateles*). My informant also remarks that one of the Worms was enclosed in a "false sac, formed by a twisting of that portion of the serous membrane which is immediately connected with the inferior curvature of the stomach." It further appears that the example in question was the smallest of the five, although I found it to measure upwards of twenty inches without any stretching. Whilst the Vienna helminthologist, Diesing, only allowed an extreme length of four inches for the male worm, the French authority, Dujardin, stated that specimens had been reported up to a length of 12½ inches. Females have been recorded as reaching a a length of 5 feet.

Not being acquainted with any satisfactory representation of this Entozoon, I have thrown the parasite into a series of folds so as to enable me to display its full length and general appearance (Plate XVIII. fig. 1). I have also added an enlarged and accurate outline representation of the head and neck (fig. 2). The description of the Worm by Dujardin leaves little or nothing to be desired. Speaking of the tail, he observes that the extremity is furnished with two or three papillæ, serially disposed in front of or above the point. I examined



T.S.C. del. J.Smit, lith.

M & N Hanhart imp.

NEW OR RARE NEMATODE ENTOZOA.

these minute prominences carefully (fig. 3). There were two short conical papillæ placed within about the $\frac{1}{800}$ of an inch from the actual extremity, the point itself being furnished with an excessively minute prominence, whose base scarcely exceeded the $\frac{1}{10000}$ of an inch in diameter. There was a very distinct appearance of a centrally placed duct (which I regarded as the tubular extension of a large caudal gland), the end of which had apparently become detached from the interior of the minute terminal papilla. As already remarked by Dujardin, the lateral lines of the body are brown-coloured and very conspicuous. I was particularly struck with the remarkable distinctness of the contents of the seminal tubes, whose separate particles could readily be seen through the thick integuments. Unwilling to injure the specimen, which I afterwards returned to Mr. Smith, I merely inserted the point of a fine needle into the main channel, and thus obtained a large quantity of the spermatozoa. These small particles, notwithstanding their long immersion in strong spirit, presented a tolerably characteristic appearance—the larger and fully formed corpuscles giving a long diameter of $\frac{1}{1400}$ of an inch (fig. 4). I may add that several of the corpuscles displayed, more or less perfectly, the well-known flask-shaped envelopes so often described in connexion with this group of parasites.

5. Spiroptera turgida, Duj. (Plate XVIII. fig. 5.)

On the 15th of April, 1873, I examined the contents of a small phial in which were two Worms that I had long previously received from Dr. Murie. They were sent to me during the time of his official connexion with the Society's Menagerie. The smaller parasite, as was stated on a label, came from the stomach of an Opossum (*Didelphys azaræ*). The worm was evidently a female, but, unfortunately, not in a satisfactory state of preservation. It measured more than an inch in length by $\frac{1}{10}''$ in breadth. The accompanying figure may be useful (fig. 5); but the minute characters were mostly either lost or obscured. The mouth was round, and certainly furnished with several minute teeth, the number of which could not be accurately ascertained.

6. Ascaris cuspidata, T. S. C. (Plate XVIII. fig. 6.)

The larger of the two Worms above mentioned appears to be new to science. Dr. Murie labels it as having been obtained from the stomach of a Green Monkey. I have little doubt that his record refers to one of the Monas (*Cercopithecus*). The Worm is a true Ascaris, and, although a male, measures fully 3¼ inches from head to tail. Owing to imperfect preservation, the spicules have been lost. The three oral lobes are particularly prominent. The caudal extremity is furnished with a very fine spine, or cusp, formed by an extension of the epidermis (fig. 6). This minute cusp curves backwards, and measures only $\frac{1}{1000}$ inch in length by the $\frac{1}{8000}$ inch in breadth at the narrowest part. The anal aperture is placed at a distance of $\frac{1}{50}$ inch from the extremity of the tail. The eggs have a long diameter of about the $\frac{1}{500}$ of an inch.

7. **Ascaris maculosa** (Rud.). (Plate XVIII. figs. 7–10.)

On the 9th of October, 1873, I received a letter from Dr. J. Alexander Macdonald, of Woburn, Bedfordshire, stating that he had forwarded to me a pigeon which had been found dead on the previous morning. It seems that the owner of the bird had erected a large pigeon-house, and had imported a number of Antwerp Smerles, these birds all continuing in a perfect state of health until about a week before the above-mentioned date, when, to use Dr. Macdonald's words, "first one and then another was attacked, and so on, until four or five of the pigeons had died after a few hours' illness." The suddenness of these attacks not unnaturally suggested poisoning; and, accordingly, says my informant, the owner "had the curiosity to open one of the birds, when, to his astonishment, he found the intestines stuffed with worms."

Under these circumstances I was invited to make an accurate inspection of the pigeon forwarded to me, likewise to report the results of my examination, and to suggest any remedial or prophylactic measures which might be likely to prove useful.

Two days later I received a letter from Dr. Macdonald stating that several others of the flock had died, and it further appeared to him probable that the daily list of sick and dying would continue to increase. On the 14th of the month my informant reported that three more of the birds were dead; but this mortality still left twenty-five birds in the owner's possessson, some of which were affected. Under these circumstances I lost no time in forwarding a full report of the facts observed, together with the recommendation that a few grains of santonine should be mixed with the food. Speaking of the birds seen on the 14th October, Dr. Macdonald says that "one which appeared in a hopeless state was at once treated (by the owner) to two grains of santonine;" and when my informant saw the bird in the afternoon of the same day "it had so far recovered as to be hopping about and picking up food." On the 4th of the following November the same correspondent obligingly informed me that the epidemic had been "at last mastered." It seems that altogether twelve birds had perished, the remainder now appearing perfectly healthy.

It is not stated whether the final and satisfactory result appeared to be due to the administration of the remedies I had recommended; but, in any case, the cessation of the disorder following so close upon the employment of santonine is worthy of being noticed. I had almost hoped that my report, in the interests of science, would be published; but, so far as I am aware, such has not been the case. In regard, however, to the dissection (upon which that report was mainly based), I have felt sure that the scientific and practical data it supplied were of sufficient interest to be placed on permanent record. The necessary dissections and microscopic examinations were made on the 9th and 10th of October, whilst the bird was perfectly fresh. The blood, muscles, and cellular tissues, and every organ of the body, apart from the digestive apparatus, were found to be thoroughly healthy; and it was only when the alimentary canal had been laid open that I found any visible traces of parasitic disease. From the lower opening of the crop downwards to the termination of the small intestine the canal was more or less crowded with nematode entozoa, all of them being referable to the above-named species. In spite of this state of things, and notwithstanding, also, that the small intestine was inflamed throughout (showing several large ulcerated patches, which here and there measured fully an inch in length), the body of the pigeon exhibited no traces of emaciation. From this it was evident that the parasites had developed rapidly, and that the malady had a correspondingly rapid formation. The local distribution of the parasites themselves was especially noteworthy. One specimen, two inches long, extended from the crop to the proventriculus. The cavity of this latter organ and also that of the gizzard were crammed with worms, which completely blocked the passage between the two. Three of the worms had also placed themselves within the pyloric opening, their bodies partly lodging within the upper part of the duodenum. The duodenum itself was crowded with these Ascarides; but their numbers somewhat decreased towards the lower folds of the small intestine. I removed 36 worms from the œsophagus, proventriculus, and stomach, besides 166 others from the intestinal canal, thus obtaining a total of no less than 202 nematodes from this solitary avian bearer. Considering the comparatively large size of these entozoa, this high degree of infection must be pronounced remarkable. The largest female worms measured 2¼ inches in length. One of the most interesting facts—serving to exemplify a well-known habit of lumbricoid worms generally—consisted in the circumstance that two of the parasites had succeeded in perforating the horny lining membrane of the gizzard. The injuries had evidently been accomplished during the life of the host, since the walls of the gizzard were inflamed opposite the perforations made by the heads of the parasites. There was a little half-digested and green food within the stomach, the débris of which, when placed under the microscope, showed several characteristic nematode ova. There were no free embryos anywhere discernible; neither had the development of the freed eggs proceeded beyond the coarsely granular stage of yolk-segmentation. Free eggs were also found both in the small and large intestine. The eggs measured about $\frac{1}{360}$ inch by $\frac{1}{700}$ inch in diameter (fig. 7). An admirable description of the adult parasite has been given by Dujardin; but since the published figures of Rudolphi, Goeze, and Bremser are incomplete, I have thought it desirable to supplement them with others. Thus fig. 8 gives a magnified view of the head of a small female *Ascaris maculosa*, and shows especially the crenulations or transverse striæ on the *alæ* or lateral membranous appendages. These are veritable annulations, or fine circular striæ, and not merely contractions of the integument as some have supposed. Dujardin speaks of the alæ as scarcely visible; but I always found them more or less well marked and semielliptic in shape, as Rudolphi originally described them. Another sketch (fig. 9) shows an enlarged view of the tail of the male; and, on the whole, this representation agrees very well with Bremser's figure of the same part. The arcuate spicules, however, are not so sharp at their tips as his illustration implies, and they are certainly more uniform in thickness. Dujardin remarks that Rudolphi has represented the spicules as being straight, whereas he himself always found them curved. Rudolphi, however, was scarcely in error, since I have repeatedly noticed that these arcuate organs are very nearly straight in their perfectly retracted condition. Like Dujardin (and without having previously consulted his description), I was particularly struck with the appearances presented by certain large perivisceral corpuscles, the presence of which originally suggested the specific name of the worm. Dujardin very appropriately calls them *corpuscules orbiculaires diaphanes*, but compares them, somewhat unfortunately, to little acephalocysts. These bodies, as he says, are many times larger than the ova. For my own part, I believe they are nutritive in character, and, like the fluid in which they float, are, I suspect, chemically comparable to the juice of flesh. At all events, Dr. Marcet has proved that the perivisceral fluid of the large lumbricoid worm of the horse (*Ascaris megalocephala*) partakes of this character; and it is no uncommon thing to notice similar corpuscles in the bodies of other nematode worms. Dujardin himself refers to similar bodies in an Ascaris from the Perroquet. I have purposely represented a few of the eggs along with the nutritive corpuscles, side by side, in order to show their relative sizes (fig. 10).

Notwithstanding the facts thus set forth in connexion with the parasitic epidemic affecting the Antwerp Smerles, the entozoa in question do not appear to be very common. Dujardin has remarked that Heister, at Rostok, and Gebauer, at Breslau, found this parasite abundant at the beginning of the 18th century; but, according to examinations conducted at Vienna, the worm was found in the Common Pigeon in only 11 instances out of 245, and thrice only in 38 examples of the Ring-Dove; moreover the examination of 87 other pigeons and doves of different species yielded entirely negative results. These data are of high practical interest, and they serve to throw light upon questions of epidemiology. I may add that the Dublin helminthologist, Bellingham, long ago noticed the occurrence of this parasite in Ireland.

EXPLANATION OF PLATE XVIII.

Fig. 1. *Filaria gracilis*: male, nat. size.
2. The same: head and neck, enlarged 40 diam.
3. The same: tail, mag. 70 diam.
4. The same: spermatozoa, mag. 350 diam.
5. *Spiroptera turgida*: nat. size.
6. *Ascaris cuspidata*: tail, enlarged.
7. *Ascaris maculosa*: egg, mag. 330 diam.
8. The same: head of female, mag. 20 diam.
9. The same: tail of male, mag. 35 diam.
10. The same: eggs and nutritive corpuscles, enlarged.

February 17, 1874.

George Busk, Esq., F.R.S., V.P., in the Chair.

A communication was read from Mr. W. N. Lockington, of Myrtle Cottage, Rolmerville, Humboldt co., California, containing notes on the Mammals and Birds met with in that part of the State of California.

A communication was read from Dr. Richard Schomburgk, Director of the Botanic Gardens, Adelaide, containing an account of the nesting-habits of a pair of Australian Coots (*Fulica australis*) as observed in those Gardens.

The special point of interest was that a few days prior to the hatching of the eggs by the female, the male made a new nest some distance off for the reception of the young birds. This new nest was used by the young brood occasionally in the day-time, and always at night.

The following papers were read:—

1. Description des Oiseaux nouveaux du Pérou central. Par L. Taczanowski, Conservateur du Musée de Varsovie, C.M.Z.S.

[Received February 3, 1874.]

(Plates XIX., XX., & XXI.)

M. Constantin Jelski, pendant son séjour au Pérou central, dans le courant des trois dernières années, a receuilli et déposé au Musée de Varsovie une collection ornithologique composée de 500 espèces. Il les a recueillies aux environs de Lima, à Huanta et Monte-Rico, ensuite aux environs de Tarma, et principalement à Amable-Maria (colonie dans la Montana de Vitoc), à Maraynioc et aux alentours du lac Junin. Toutes ces contrées ont été explorées par Tschudi, à l'exception de Monterico, qui n'a pas été visité par ce voyageur.

Comme M. Jelski a interrompu pour le moment ses explorations dans les contrées que je viens d'indiquer, pour les entreprendre au nord et ensuite au sud de ce vaste pays, j'ai l'intention de publier une liste complète des oiseaux qu'il y a trouvé, aussitôt que me parviendra son dernier envoi, qui est déjà en route.

En attendant je publie les descriptions d'une partie des espèces nouvelles; les autres ont été décrites par le Dr. Cabanis, et publiées dans le 'Journal für Ornithologie'*.

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* Les espèces décrites par le Dr. Cabanis sont les suivantes:—*Hylophilus flaviventris*, sp. nov., J. f. O. 1873, p. 64; *Dacnis modesta*, sp. nov., *ibid.*; *Conirostrum cinereum*, Lafr. et d'Orb., *ibid.*; *Hypocnemis subflava*, sp. nov., p. 65; *Thamnistes rufescens*, sp. nov., p. 65; *Lochmias obscurata*, sp. nov., p. 65; *Philydor subflavescens*, sp. nov., p. 66; *Ipoborus* (*Automolus*) *stictoptilus*, sp. nov.,

J'ai tâché, autant qu'il était possible, de conserver à ces espèces les noms imposés par M. Jelski, qui possède des notions très-importantes sur les oiseaux du pays qu'il explore.

Tous les types de ces descriptions, ainsi que de celles du Dr. Cabanis, sont déposés au Musée de Varsovie, à part quelques-uns, en petit nombre, qui se trouvaient en doubles, et qui ont été envoyés au Musée de Berlin.

Je suis heureux de pouvoir exprimer ici ma reconnaissance à Mr. Sclater pour le bienveillant empressement avec lequel il m'a ouvert l'accès de sa riche collection d'oiseaux d'Amérique, ainsi que pour l'obligeance qu'il a mise à m'aider dans mes travaux pendant mon séjour à Londres.

1. CISTOTHORUS GRAMINICOLA, Jelski, MS.

Rufo-brunneus, pileo fusco fulvoque striato; macula magna interscapulari nigra, striis fulvis notata; remigibus rectricibusque rufescente nigroque transversaliter fasciatis; gula et medio abdomine albis; vitta superciliari fulva; subalaribus albidis: rostri brunnei mandibula et pedibus pallide carneis; iris fusco-brunnea. Long. tota 10·5; *alæ* 45, *caudæ* 47, *tarsi* 22, *rostri a commissura* 15 *mill.*

Mâle adulte et jeune oiseau, tués le 16 Juin, à Maraynioc.

L'oiseau le plus voisin de *Cistothorus polyglottus* (Viell.), mais différent par les proportions et la force du bec, ainsi que du tarse; sa tache interscapulaire est moins grande; la couleur de la partie postérieure du dos et du croupion plus foncée.

L'oiseau jeune en premier plumage a la couleur dorsale plus foncée; les stries de l'occiput peu apparentes; la tache interscapulaire moins prononcée, d'un brun noirâtre à stries fauves plus sombres et moins distinctes; la couleur des côtés du dessous plus pâle; le blanc de la gorge et du milieu du ventre moins pur.

2. THRYOTHORUS CANTATOR, Jelski, in litt.

Supra cinnamomeus, pileo griseo, dorso brunneo tincto; genis obscure griseis; gula alba, pectore et ventre grisescenti-fulvis; remigibus fusco-nigricantibus cinnamomeo limbatis; rectricibus grisescenti-rufis nigre fasciatis: rostri nigricantis mandibula flavida; pedibus iridibusque brunneis. Long. tota 150; *alæ* 70, *caudæ* 65, *tarsi* 22, *rostri a commissura* 20 *mill.*

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p. 66; *Sclerurus olivascens*, sp. nov., p. 67; *Euscarthmus rufigularis*, sp. nov., p. 67; *Phyllomyias cinereicapilla*, sp. nov., p. 67; *Capsiempis orbitalis*, sp. nov., p. 68; *Hadrostomus audax*, sp. nov., p. 68; *Xenodacnis parina*, sp. et gen. nov., p. 312; *Turdus gigantodes*, sp. nov., p. 315; *Basileuterus diachlorus*, sp. nov., p. 316; *Myiothlypis striaticeps*, sp. nov., p. 316; *Iridornis jelskii*, sp. nov., p. 316; *Pœcilothraupis lacrimosa* (Du Bus), p. 317; *P. ignicrissa*, sp. nov., p. 317; *Presbys peruanus*, sp. nov., p. 317; *Diglossa pectoralis*, sp. nov., p. 318; *Chlorospongus* (*Hemispongus*) *auricularis*, sp. nov., p. 318; *Hypsibamon andicolus*, sp. nov., p. 318; *Cillurus rivularis*, sp. nov., p. 319; *Synallaxis humilis*, sp. nov., p. 319; *S. albicapilla*, sp. nov., p. 319; *Schizœaca palpebralis*, gen. et sp. nov., p. 319; *Mitrephorus ochraceiventris*, sp. nov., p. 320.

Deux mâles, tués le 9 Février 1872, à Amable Maria (Montana de Vitoc).

Espèce la plus voisine de *Thryothorus coraya.*

3. DACNIS XANTHOPHTHALMA, Jelski, in litt.

Supra grisea, subtus albida, lateribus grisescentibus, subalaribus albis, crisso subcaudalibusque fulvis: rostro nigricante; pedibus brunneis; iridibus flavis. Long. tota 130; *alæ* 67, *caudæ* 65, *tarsi* 18, *rostri a commissura* 13 *mill.*

Femelle unique, tuée à Maraynioc, le 3 Juillet 1871.

Cette espèce a le bec plus mince que les autres *Dacnis,* mais moins conique que les *Conirostrum,* à mandibule supérieure légèrement courbée à l'extrémité; elle constitue douc le passage entre ces deux groupes. Sa queue est aussi plus longue que dans la plupart des *Dacnis.* Sa coloration est très-simple, d'un gris foncé à une légère nuance brunâtre en dessus, et d'un blanc sale en dessous; ces deux couleurs sont parfaitement tranchées sur la tête et le cou, les côtés de la poitrine et du ventre sont grisâtres, passant insensiblement au blanc du milieu de ces parties du corps; le bas du ventre et les sous-caudales sont fauves. Les ailes et la queue sont de la couleur du dos, les remiges primaires sont finement liserées de blanchâtre.

DACNIDEA, n. g.

Dans son ensemble ce genre a beaucoup d'analogie avec le genre *Dacnis,* mais le bec est plus court et beaucoup plus fort, à l'arête de mandibule supérieure beaucoup plus convexe, et aux bords des deux mandibules plus rentrants en dedans. Les pattes ressemblent beaucoup à celles des *Dacnis*; mais le tarse et les doigts sont considérablement plus épais, ils sont vêtus comme dans ces derniers. La troisième remige est la plus longue, la deuxième plus courte que la quatrième, qui est presque égale à la troisième. La queue est médiocre, à toutes les rectrices d'égale longueur. Le plumage est de même nature que celui des *Dacnis*; les formes du corps plus trapues.

4. DACNIDEA LEUCOGASTRA, sp. nov. (Plate XIX. fig. 2.)

Supra grisea: capite cinerascente, dorso plus aut minus olivaceo tincto; vitta superciliari a naribus ducta alba; subtus albida, lateribus grisescentibus, crisso subcaudalibusque fulvis, medio abdomine pure albo; genis albo griseoque variis; remigibus rectricibusque fuscis, olivaceo limbatis; subalaribus albis: rostro plumbeo; pedibus brunnescenti-griseis; iride obscure brunnea. Long. tota 136; *alæ* 63, *caudæ* 65, *tarsi* 20.

Deux mâles, tués en Juillet 1871 à Maraynioc.

La teinte olivâtre du dos n'est pas également prononcée sur les deux exemplaires; sur l'individu tué au commencement de Juillet elle est beaucoup plus faible, de manière que la couleur de la partie postérieure diffère très-peu de celle de la tête, et l'olive n'est distinctement prononcé qu'au croupion.

MICROSPINGUS, n. g.

Ce genre sera intermédiaire entre les *Nemosia* et *Chlorospingus*; l'oiseau pour lequel je le propose a le bec aussi mince que les espèces du premier de ces genres, mais plus court, et ressemblant plus par sa forme générale à ceux du second. En général il a les formes plus sveltes que les *Chlorospingus*, un pareil mode de coloration, la queue plus longue, à rectrices égales, excepté les externes, qui sont plus courtes que les autres, les ailes plus longues et moins obtuses à 3ᵉ, 4ᵉ, et 5ᵉ remiges les plus longues et presque égales entre elles.

5. **MICROSPINGUS TRIFASCIATUS**, Jelski, in litt. (Plate XIX. fig. 1.)

> *Capitis atri area mediana olivascenti-grisea; vitta superciliari a naribus usque ad nucham ducta flavicanti-albida; dorso et uropygio obscure olivaceis; subtus rufescenti-fulvus, mento albido, medio abdomine luteo: tectrices alarum dorso concolores fasciis binis fulvis transverse notatæ; remiges primarii subtiliter flavido limbati. Rostri nigricantis mandibula inferior pallide cornea; pedes carnei; irides obscure brunneæ. Long. tota* 135; *alæ* 70, *caudæ* 70, *tarsi* 22, *rostri a commissura* 13, *a naribus* 7 *mill.*

Mâle unique, tué le 29 Juillet 1871, à Maraynioc.

Il ressemble le plus à *Chlorospingus castaneicollis*, Sclater, mais il a le bec beaucoup plus mince.

6. **CHLOROSPINGUS CINEREOCEPHALUS**, Jelski, MS.

> *Capite nuchaque fusco-cinereis, regione suboculari nigricante; dorso toto tectricibusque alarum olivascenti-viridibus; gula flavescenti-albida; pectore abdomineque medio albis, lateribus flavo-viridibus; subalaribus albis, flavo lavatis; remigibus rectricibusque fuscis, olivaceo limbatis. Rostri nigricantis mandibula pallida; pedes cinereo-cornei; iris pallide cinerea. Long. tota* 125; *alæ* 65, *caudæ* 53, *rostri a commissura* 17, *a naribus* 8 *mill.*

Femelle unique capturée à Chilpes, le 17 Août 1871.

C'est une forme voisine de *Chlorospingus albitemporalis*, Lafr. = *C. ophthalmicus*, Cab., mais à bec plus épais; elle n'a point de tache blanche derrière l'œil et de nuance verte sur la poitrine.

7. **SPERMOPHILA SIMPLEX**, Jelski, MS.

> *Supra olivascenti-grisea, subtus albida, lateribus pectoreque grisescentibus, medio abdomine flavescente lavato; alæ fasciis binis speculoque albis variegatæ. Rostrum rubescenti-corneum; pedes brunnei; iris fusco-brunnea. Long. tota* 110; *alæ* 61, *caudæ* 50, *tarsi* 17, *rostri a commissura* 10, *altitudo rostri* 7 *mill.*

Plusieurs individus des deux sexes et jeunes, tués en Janvier 1870, aux environs de Lima.

Les deux sexes, dont la coloration est complètement identique, ont la partie supérieure de tout le corps d'une couleur gris-olivâtre, l'inférieure blanchâtre, enduite de grisâtre sur la poitrine et sur les côtés du ventre et lavée d'une teinte jaunâtre très-faible au ventre. Les ailes sont traversées de deux larges bandes blanches, formées par les extrémités des deux derniers rangs de couvertures, et d'un petit miroir blanc, composé de la réunion des bordures de la barbe externe des remiges primaires dans leur partie basale. Les remiges sont bordées d'un fin liseré olivâtre, excepté les trois scapulaires, qui sont entourées d'une large bordure blanc-grisâtre. Les subalaires sont blanches, lavées légèrement de jaunâtre au bord de l'aile.

Les jeunes dans le premier plumage diffèrent des adultes par une teinte légèrement brunâtre des parties supérieures, qui domine aussi sur les parties blanchâtres inférieures ; les bandes blanches alaires sont moins prononcées et enduites d'une teinte roussâtre, ainsi que les bordures des remiges scapulaires.

Dans la collection de Mr. Sclater j'ai vu une paire de ce *Spermophila*, envoyé par Mr. Nation, de Lima, sans indication de sexe.

8. SYCALIS RAIMONDII, Jelski, MS.

S. luteiventri *simillima: dorso cinerascenti-griseo, fusco striato; uropygio vix flavescente tincto; collo, pectore medioque abdomine luteis, lateribus grisescentibus; fronte et vitta superciliari flavo virescentibus. Rostrum plumbeo-corneum; pedes sordide carnei; iris fusco-brunnea. Long. tota* 115, *alæ* 75, *caudæ* 45, *tarsi* 17, *rostri a commissura* 10 *mill.*

Trois mâles et une femelle, tués en Janvier et Fevrier de 1870 aux environs de Lima.

Forme très-voisine de *Sycalis luteiventris*, est cependant bien distincte. La couleur du dos est gris-clair (sans nuance verdâtre), variée de flammèches brun-noirâtres, beaucoup moins larges et moins prononcées que dans l'espèce citée; le croupion est légèrement enduit de jaune-verdâtre. Le front, une large raie sourcilière et un demi-collier au cou sont teints de jeune-verdâtre, encadrant l'occiput, qui est d'une couleur analogue à celle du dos, mais à stries très-peu distinctes. La gorge, le devant du visage, le milieu de la poitrine, du ventre et des subcaudales sont jaunes, tandis que les côtés du corps sont gris. Les ailes et la queue sont comme dans le *S. luteiventris*, excepté qu'il n'y a point de teinte verdâtre à la base des remiges secondaires, le devant seulement de l'aile est légèrement coloré de verdâtre. Les subalaires sont blanches légèrement teintes de jaune par devant, tandis qu'elles sont d'un jaune uniforme dans l'oiseau cité plus haut.

La femelle diffère du mâle en ce que le jaune des parties inférieures est plus faible et plus restreint sur le milieu du corps; le jaune verdâtre du front et des sourcils est beaucoup moins prononcé, et complétement nul au cou.

La première remige est la plus longue, dépassant de très-peu la deuxième, la quatrième est considérablement plus courte.

9. OCHTHŒCA THORACICA, Jelski, MS.

Schistacea, vitta superciliari a fronte ducta candidissima, area pectorali ferruginea. Rostrum et pedes nigri ; iris fusco-

brunnea. Long. tota 116, *alæ* 67, *caudæ* 58, *tarsi* 18, *rostri a commissura* 15 *mill.*

Mâle unique, tué le 17 Aout 1871, à Chilpes.

Elle ressemble en général à *Ochthœca cinnamomeiventris* (Lafr.), de Bogota, mais elle a le bec beaucoup plus court; la couleur ferrugineuse très-foncée forme comme dans la *O. lessoni* une grande tache bien tranchée de la couleur schistacée foncée du ventre; la raie sourcilière blanche s'étend beaucoup plus loin en arrière, et derrière l'œil elle devient très-mince, tandis qu'elle est plus large par devant et se joint au front à sa congénère par un trait transversal. La partie postérieure du milieu du ventre est tant soit peu colorée de blanchâtre, ainsi que les grandes couvertures subalaires; le bord interne des remiges est liseré de roussâtre.

10. MUSCISAXICOLA RUFIPENNIS, Jelski, in litt.

Fusco-grisea, dorso uropygioque fuscis; medio abdomine albo, crisso et subcaudalibus fulvescentibus; alis caudaque fuscis, pogoniis internis remigum et rectricum ad basin late rufis, pogoniis externis rectricum lateralium albis; subalaribus fulvis: rostro pedibusque nigris; iride pallide brunnescenti-cinerea. Long. tota 205, *alæ* 132, *caudæ* 95, *rostri a commissura* 27, *a naribus* 14, *tarsi* 29 *mill.*

Femelle unique, tuée à Maraynioc le 1 Juin 1871.

Cette grande espèce est d'une couleur grise en général, plus foncée en dessus qu'en dessous, et prenant un ton plus sombre et tirant un peu sur le brunâtre au dos et au croupion. Le milieu du ventre est blanc pur, tandis que les subcaudales ont une légère nuance fauve. Les ailes et la queue sont noirâtres à barbes internes d'une belle couleur rousse dans leur partie basale, s'étendant dans les secondaires jusque près de l'extrémité, tandis qu'elle finit beaucoup plus tôt dans les primaires. Les rectrices sont de la même couleur rousse dans les trois quarts de leur barbe interne, excepté les médianes, qui sont noirâtres en entier. Le bord des rectrices latérales est blanc, ainsi qu'un mince liseré à l'extrémité de toutes; il y a aussi de pareils liserés au bout des remiges. Le fauve des couvertures subalaires est plus intense que celui des subcaudales. Le bec et les pattes sont noires; l'iris d'une couleur gris-brunâtre claire, piqueté de points plus foncés.

Par la mode de coloration cet oiseau a beaucoup d'analogie avec les *Myiotheræ*, mais il s'en distingue par son bec beaucoup moins fort et les pattes plus élevées et plus minces.

11. LEPTOPOGON AURITUS, Jelski, M.S.

Dorso viridi, capite fusco-cinereo, macula auriculari obscuriore, circulo auriculari albo: subtus flavus, pectore olivascente tincto; alarum fuscarum tectrices rufo vivide maculatæ, remiges tertiarii rufo latissime limbati. Rostrum nigrum; pedes plumbei; iris fusco-brunnea. Long. tota 120, *alæ* 65, *caudæ* 55, *tarsi* 15, *rostri a commissura* 17 *mill.*

L'unique exemplaire, dont le sexe n'est pas indiqué, tué à Amable-Maria en Décembre 1871.

Cette espèce est voisine de *L. pœcilotis*, mais elle a le bec considérablement plus long; les taches rousses rangées sur les couvertures alaires en deux bandes régulières; les remiges sont liserées de fines bordures vertes excepté les tertiaires, dont les bordures sont larges et d'une belle couleur roussâtre; la bordure interne dans toutes les remiges est aussi roussâtre. Sa calotte est d'une couleur schistacée; l'œil est entouré d'un cercle blanc composé d'une rangée de petites plumes; quelques plumes blanches forment aussi une ligne assez distincte en arrière de l'œil et une tacheture irrégulière sur les côtés du visage; la tache auriculaire est moins foncée que dans l'espèce citée. Les subalaires sont d'une belle couleur jaune roussâtre; les rectrices bordées de vert; la poitrine est olivâtre; la gorge grisâtre; le ventre jaune-pâle, à côtés légèrement teints de vert olivâtre.

12. **Pogonotriccus ophthalmicus**, sp. nov.

Viridis, pileo fusco-cineraceo, macula auriculari nigra, annulo oculari albo; tectrices alarum viridi-olivaceæ binis fasciis flavidis notatæ; subtus virescenti-flavus, pectore olivacescente tincto; remiges et rectrices fusci, viridi marginati. Rostri nigricantis mandibula pallida; pedes pallide cornei; iris brunnea. Long. tota 105, *alæ* 55, *caudæ* 50, *tarsi* 15, *rostri a commissura* 13 *mill.*

Mâle et femelle tués en Février et en Mars 1872, aux environs d'Amable-Maria.

Cet oiseau ressemble au *P. eximius* (Temm.) du Brésil, mais il lui manque de teinte verte au sommet de la tête; le tour de l'œil est dans notre espèce blanc, tandis qu'il est jaune dans l'espèce brésilienne; les taches des couvertures alaires sont différentes; le bec plus long. Il ressemble aussi au *P. plumbeiceps*, de Bogota, mais il est plus petit, et son bec présente une différence plus grande que celui de l'espèce citée plus haut. En mode de coloration il a beaucoup d'affinités avec les *Leptopogon*, surtout avec le *L. pœcilotis* et avec celui que je viens de décrire sous le nom de *L. auritus*; il a les côtés de la tête également tachetés de blanc, une pareille tache foncée sur l'oreille, les couvertures alaires également variées, ainsi que la bordure des remiges scapulaires plus large et plus claire que sur les autres.

DOLIORNIS, gen. nov.

Le bel oiseau pour lequel je constitue ce genre est très-voisin du genre *Carpornis*, Gr., mais s'en distingue en plusieurs détails, qui me paraissent suffisants pour motiver une séparation générique. Le bec est considérablement plus court, moins fort, médiocrement large à la base et graduellement atténué vers sons extrémité; la mandibule supérieure dépassant la mandibule inférieure est plus courbée au bout que dans les *Pipreola*; l'arête est arrondie et peu prononcée. Les narines sont rondes et dénudées. Les remiges primaires sont subaiguës, sans être atténuées; les 7^e^ et 5^e^ égales et les plus longues, 3^e^ et 6^e^ égales entre elles et un peu plus courtes que les précédentes, la 2^{e} égale à la 7^{e}. La queue est médiocre, large, coupée presque carrément à l'extrémité. Tarse médiocre et faible. Le plumage est abondant, long et soyeux; le sommet de la tête est comme dans la plupart des Tyrans et d'Elaineas, garni sur les côtés de longues plumes noires, tandis que celles du milieu sont plus courtes et d'une couleur tout-à-fait différente.

13. **DOLIORNIS SCLATERI**, n. sp. (Plate XX.)

Occipite medio vivide rubro-cinnamomeo, lateribus occipitis cum fronte nigris; dorso brunnescenti-fusco; mento, collo genisque cineraceis; pectore et ventre brunneis, hoc postice dilutiore; subcaudalibus cinnamomeis; remigibus rectricibusque nigricantibus, primariis externe albido tenuissime limbatis: rostro pedibusque nigris; iridibus sordide violaceo-fuscis. Long. tota 190; *alæ* 100, *caudæ* 90, *rostri a commissura* 21, *a naribus* 9, *tarsi* 25 *millim.*

Mâle unique de Maraynioc, tué le 9 Juin 1871.

14. **CORYTHOPIS HUMIVAGANS**, Jelski, MS.

Dorso olivaceo, pileo caudaque obscurioribus; subtus alba, pectore nigro striato, lateribus olivaceis. Rostri nigricantis mandibula albida; pedes cornei; iris brunnea. Long. tota 125; *alæ* 67, *caudæ* 73, *tarsi* 27, *rostri a commissura* 19 *mill.*

Mâle unique tué à Amable-Maria le 12 Février 1872.

Cette espèce ressemble beaucoup à *C. anthoïdes*, Cuv., mais elle est un peu plus grande, à bec un peu plus long et plus mince. La couleur des parties supérieures est plus foncée, celle du dessus de la tête et de la queue se distingue évidemment de la couleur du dos, tandis que dans l'espèce citée toutes ces parties sont presque concolores. Du reste, la gorge et le milieu du ventre sont de même blancs purs; les taches noires en forme de pinceau sont également confondues au-devant de la poitrine pour former une grande tache presque uniforme, et ensuite elles sont éparses.

15. **HERPSILOCHMUS MOTACILLOIDES**, Jelski, in litt.

Pileo nigro albo maculato, fronte rufescente, dorso griseo; subtus albus, flavido tinctus; vitta superciliari alba, postoculari nigra. Tectrices alarum nigræ, albo maculatæ; remiges fusco-nigricantes, griseo limbati; rectrices medianæ nigricantes, laterales albæ. Rostrum et pedes nigricanti-plumbei; irides fusco-brunneæ. Long. tota 128; *alæ* 55, *caudæ* 60, *tarsi* 20, *rostri a commissura* 11 *millim.*

Une paire tuée à Maraynioc en Février et en Mars 1872.

Le dessus de la tête de cet oiseau est noir, teint de roussâtre au front et varié sur le milieu du vertex de taches blanches donnant deux rangées longitudinales. Le dos est d'une couleur grise uniforme. Tout le dessous de l'oiseau et les couvertures subalaires sont d'une couleur blanche lavée de jaunâtre, plus prononcée au milieu de la poitrine et du ventre. Au-dessus de l'angle antérieur de l'œil commence une raie sourcilière blanche qui s'étend jusqu'à la nuque en s'élargissant graduellement, et bordée en-dessous d'une raie noirâtre qui prend naissance à l'angle postérieur de l'œil. Les couvertures alaires sont noires et terminées de blanc; elles forment trois bandes transversales, dont les deux postérieures sont presque continues, et la troisième incomplète; le poignet de l'aile est nuancé de gris. Les remiges sont noirâtres à bordures grises assez fines, mais dont la réunion donne une couleur dominante grise sur l'aile pliée; les bordures des remiges tertiaires sont plus larges et blanches. Les deux rectrices médianes sont noirâtres en entier, les suivantes terminées seulement par une petite tache blanche, celles de la troisième paire ont plus de blanc à l'extrémité et un liseré aux bords dans la moitié terminale; sur les trois autres le blanc prédomine, de manière que la rectrice externe n'a de foncé qu'à la naissance de sa barbe interne.

Cette espèce est très-voisin de *H. atricapillus*, mais elle s'en distingue principalement par la tacheture de l'occiput.

16. MYRMOTHERULA ATROGULARIS, sp. nov.

Fusco-cinerea, gula nigra; tectrices alarum nigræ albo guttatæ, Mas subtus cinereus, postice fulvo indutus. Fœmina subtus rufescenti-fulva, gula nigra albo maculata. Rostrum et pedes nigricantes; iris fusco-brunnea. Long. tota 96; *alæ* 54, *caudæ* 35, *tarsi* 17, *rostri a commissura* 17 *millim.*

Un mâle tué à Amable-Maria le 6 Février 1872, et une femelle de Monterico tuée le 30 Avril, 1870.

La couleur des parties supérieures du mâle est d'un cendré foncé uniforme, celle des parties inférieures et des côtés du visage est beaucoup plus claire; la partie postérieure du ventre et les sous-caudales sont enduites d'une teinte roussâtre; le plastron gulaire est d'un noire intense. Les couvertures alaires sont noirâtres, terminées chacune d'une petite tache ronde; les subalaires sont d'un blanc jaunâtre claire; la bordure interne des remiges est blanchâtre.

La femelle diffère du mâle par la couleur du dos légèrement enduite de roussâtre, ce qui lui donne une teinte grisâtre moins foncée et moins pure que celle du mâle; le front et le croupion sont plus fortement enduits de roussâtre. Les parties inférieures sont d'un fauve roussâtre; le plastron gulaire noir est varié de grosses taches blanches. Les ailes comme dans le mâle.

17. THRIPADECTES SCRUTATOR, Jelski, MS.

Th. flammulato *similis, sed rostrum longius; dorsum rufescenti-brunneum fere immaculatum, uropygium cinnamomeum; caput nuchaque nigra et grisescenti-fulva, gula collumque nigro rufoque striata; subtus omnino pallide brunneus, striis fulvis subtiliter notatus; alæ caudaque cinnamomeo-rufæ; pogoniis internis remigum nigricanti-rufo marginatis. Rostrum nigerrimum; pedes brunnei; iris fusco-brunnea. Long. tota* 220; *alæ* 94, *caudæ* 105, *tarsi* 28, *rostri a commissura* 32 *mill.*

Femelle unique tuée à Maraynioc le 22 Juin 1871.

Cet oiseau ressemble beaucoup au *Th. flammulatus* (Eyt.), mais son bec est plus long, à l'extrémité de la mandibule supérieure plus crochue. Quant à sa coloration, les stries claires du milieu des plumes sont moins pures et moins prononcées, ne s'étendant pas aussi loin en arrière, elles sont à peine marquées sur la partie antérieure du dos; moins pures en-dessous, sur le ventre plus courtes et plus minces, sans bordures noires.

18. SCYTALOPUS SYLVESTRIS, Jelski, MS.

Capite, collo pectoreque schistaceis; dorso, cauda alisque fusco-brunneis; uropygio, lateribus crissoque rufo undulatis. Rostrum nigrum; pedes brunnescentes; iris fusco-brunnea. Long. tota 110; *alæ* 55, *caudæ* 42, *tarsi* 22, *rostri a commissura* 17 *mill.*

Oiseau adulte tué à Pallaypampa le 8 Mars 1872, et jeune tué à Maraynioc le 1 Juin 1871.

L'oiseau adulte a la tête, la gorge et la poitrine d'une couleur schistacée, la plus foncée au sommet de la tête, et la plus claire sur la gorge, sur la poitrine légèrement ondulée de plus clair à certaines directions de la lumière; le dos, les ailes et la queue sont d'un brun très-foncé; le croupion est ondulé de roux; les couvertures alaires et les rémiges scapulaires finement liserés de la même couleur. Le milieu du ventre est blanchâtre; les côtés et la partie postérieure du ventre bruns, ondulés de roux.

L'oiseau jeune en premier plumage diffère principalement en ce que la couleur cendrée presque uniforme occupe toute la tête, le devant du dos, les couvertures alaires et tout le dessous jusqu'au bas-ventre; les stries transversales brunes sur le croupion sont plus fines; la couleur rousse prédomine au bas-ventre; les remiges scapulaires sont plus distinctement variés de roux et de noir.

Cet oiseau ressemble au *S. griseicollis*, Lafr., mais il s'en distingue au premier coup d'œil par l'ondulation transversale de la partie postérieure du corps; sa couleur générale est plus foncée, et il est plus grand.

19. THALURANIA JELSKII, sp. nov.

Th. tschudii *simillima, sed minor, cauda breviore et minus furcata, capite uropygioque cupreo nitentibus. Rostrum nigrum; pedes nigricantes; iris nigricans. Long. tota* 90; *alæ* 57, *caudæ* 35, *rostri a commissura* 20 *mill.*

Mâle unique tué à Soriano le 10 Août 1871.

Complétement semblable à *Th. tschudii*, mais considérablement plus petite, elle diffère principalement par sa queue beacoup plus courte, moins fourchue, à rectrices considérablement moins larges. Sa coloration est tout-à-fait analogue, excepté qu'elle a une nuance bronzée assez caractéristique sur la tête et la nuque, ainsi que sur les sous-caudales; les sous-caudales sont bordées de blanchâtre.

20. HELIANTHEA DICHROURA, Jelski, MS.

Capite pectoreque viridibus, dorso cupreo, ventre fulvo-rufescente, macula jugulari violaceo-sapphyrina, fronte splendidissime smaragdinea, crisso albo; caudæ basi fulvo rufescente, apice cupreo.

Rostrum nigrum; pedes brunnescentes; iris fusca. Long. tota 145*; alæ* 80*, caudæ* 52*, rostri a commissura* 42 *mill.*

Oiseaux de différents ages de Maraynioc, capturés en Juillet 1871.

L'oiseau adulte a la tête, la gorge et la poitrine d'un vert luisant; le dos cuivreux, le plus foncé et le plus intense sur les couvertures alaires; le ventre et les subcaudales sont d'un fauve nankin sans éclat métallique, les côtés seulement sont légèrement teints de vert metallique; la région anale est blanche pure. En bas de la gorge se trouve une belle tache ovale bleue changeant en violet étincelant; le front est occupé par une tache triangulaire émeraude beaucoup plus luisante que les parties environnantes. Les remiges sont brunes à reflet violacé, l'externe est bordée d'un fin liseré roussâtre; les rectrices sont d'un fauve nankin dans leur moitié basale et d'un vert cuivreux dans la terminale, excepté les deux médianes, qui sont de cette dernière couleur dans toute leur longueur. Les subalaires sont cuivreuses, le bord de l'aile roussâtre.

L'oiseau jeune diffère de l'adulte par le manque complet des taches brilllantes jugulaire et frontale; l'éclat cuivreux au dos et sur les tectrices alaires est moins fort et moins brillant; les extrémités mêmes des rectrices latérales sont d'un fauve grisâtre.

Les oiseaux en transition qui ont déja la tache jugulaire dans tout son éclat ne possèdent pas de trace de la tache frontale, mais cette partie est de la même couleur que tout le sommet de la tête.

21. Metallura hedvigæ, sp. nov. (Plate XXI. fig. 2.)

Viridi-cuprea, area gulari oblonga splendidissime rubro-ignea ornata; cauda supra corpori concolor, sapphirino micans, subtus cupreo-viridis; crissum albidum. Rostrum nigrum; pedes brunnei; iris nigra. Long. tota 102*; alæ* 66*, caudæ* 75*, rostri a commissura* 15 *mill.*

Plusieurs individus tués à Maraynioc en Septembre 1871.

La couleur générale de ce bel oiseau-mouche est d'un vert cuivreux foncé, à éclat metallique assez fort; la base de toutes les plumes est d'un gris brunâtre avec une raie transversale claire devant la partie métallique. La gorge est ornée d'une grande tache longitudinale d'un rouge doré fort étincelant. Le dessus de la queue est de la couleur générale changeant en bleu d'acier assez intense; le côté inférieur des rectrices est d'un vert bronzé beaucoup plus luisant que le reste du plumage. Les remiges sont noirâtres à un faible éclat violacé; la première finement bordée de blanchâtre dans sa moitié basale; les subalaires externes sont bordées d'une large raie rousse, dont la réunion forme une ligne ondulée tout le long du bord antérieur de l'aile. La région anale est blanchâtre; les couvertures subcaudales roussâtres.

Je dédie ce splendide oiseau-mouche à Madame la Comtesse Hedvige Branicka.

22. Eriocnemis sappphiropygia, Jelski, MS.

Viridi-ænea, supra cupreo nitens, subcaudalibus splendide sapphirinis, pedibus albo vestitis, cauda subcyanea. Rostrum et pedes *nigri; iris nigricans. Long. tota* 110; *alæ* 67, *caudæ* 50, *rostri a commissura* 27 *mill.*

Trois individus de Maraynioc, capturés en Juin et Août 1871.

Couleur générale vert très-brillant, surtout en-dessous, à reflets cuivreux en-dessus, le plus fort sur la tête, ensuite sur les couvertures alaires, faible au dos; le croupion et les sus-caudales sont d'un vert pure. Les sous-caudales sont d'un saphire très-brillant. Les pattes sont garnies d'une abondante touffe blanche pure. Les ailes sont noires à un faible reflet pourpré; la queue bleue foncée.

Cet oiseau est voisin de *E. cupreiventris*, Gould; mais outre plusieurs différences de coloration il a le bec plus long et plus fort, la queue plus longue et moins fourchue, à rectrices considérablement plus larges.

LAMPRASTER, nov. gen.

Ce nouveau genre, que je propose pour une nouvelle espèce du Pérou central, se caractérise par le bec de moitié plus long que la tête, droit dans toute sa longueur; la queue aussi longue que le corps, large, profondémenté chancrée; les couvertures sous-caudales dépassant la moitié de longueur des rectrices; le tarse vêtu de petites plumes jusqu'à la naissance des doigts; le mode de coloration semblable à celui du genre *Phæolæma* et *Heliodoxa.*

23. LAMPRASTER BRANICKII, sp. nov. (Plate XXI. fig. 1.)

Splendide viridis, scutello gulari splendidissime rubineo vittaque mediana occipitali vivide smaragdinea ornatus; remiges secundarii cinnamomei, fusco terminati; subcaudales et crissum pure albæ. Long. tota 105; *alæ* 68; *caudæ* 40; *rostro a commissura* 26.

Mâle unique tué à Monterico, aux environs de Huanta par M. Constantin Jelski, qui explore ce pays depuis trois ans, avec des succès tres-importants pour la science.

La couleur générale de ce bel oiseau est verte metallique, à éclat beaucoup plus brillant sur les parties inférieures du corps; une raie verte fort brillante, changeant en bleu traverse le milieu de la calotte en commençant a la naissance du bec, tandis que le haut de la gorge est occupé par un écusson fort brillant d'un rose rubiné prenant un léger ton violacé sous certaines directions de la lumière, et une nuance dorée dans sa partie supérieure, qui touche au vert brillant couvrant le menton. Les remiges sont noirâtres, excepté les secondaires, qui sont d'une belle couleur rousse-cannelle à extrémité noirâtre; les rectrices sont aussi noirâtres à un faible éclat violacé, excepté les deux médianes, qui sont vertes. Les sous-caudales, le bas-ventre et les plumes du tarse sont d'un blanc pur, ainsi qu'une petite strie en arrière de l'œil.

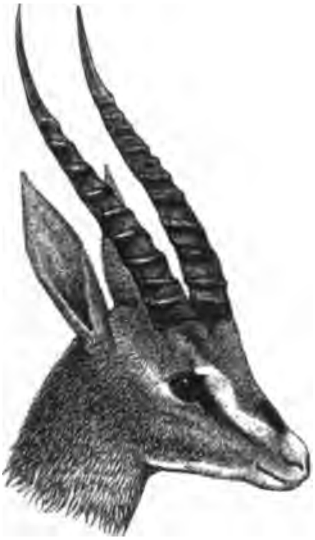
Je suis heureux de pouvoir dédier ce magnifique oiseau-mouche à M. le Comte Constantin Branicki, aux soins duquel le Musée de Varsovie est redevable de son développement, et dont les moyens employés avec justesse ne cessent de procurer à la science d'importantes nouveautés dans presque toutes les branches zoologiques.

2. On a New Species of Gazelle living in the Society's Menagerie. By Sir Victor Brooke, Bart., F.Z.S.

[Received January 14, 1874.]

(Plate XXII.)

The Society has lately received from Muscat[*] a pair of Gazelles (male and female), which differ distinctly from the *Gazella arabica* of Hemprich and Ehrenberg, of South-western Arabia. This species, at the time I read my paper on this group (P. Z. S. 1873, p. 535), I believed to be the only representative of the genus *Gazella* found in Arabia to the south of 28° N. lat.



Horns of *Gazella arabica*.

Instead of the massive, nearly straight, non-lyrate horns of *Gazella arabica* (see figure)[†], the horns of the Muscat Gazelles are rather slender, compressed from side to side, and distinctly lyrate, their points being turned boldly forwards and inwards, the form being thus excluded from the non-lyrate subsection *b'* of my analytical list (*l. c.* p. 537), which contains *Gazella arabica*, and placed in the subsection *a'*, which contains the species with lyrate or semi-lyrate horns.

In their general appearance, also, the Muscat Gazelles differ decidedly from *Gazella arabica*. In the latter the hair is short, close-set, and of a rich grizzled bay; whilst the coats of the Muscat Gazelles are remarkably long and soft, and of a very beautiful silvery grey colour. In size they are inferior to *G. arabica*, and in delicacy of form and beauty even exceed that lovely species. From *G. dorcas*, to which species they bear more resemblance, the Muscat Gazelles differ in their smaller size, in their very different and much darker colour, and in the intensity of the facial and lateral markings. These differences can be appreciated at a glance in the Society's Menagerie, where the two species are represented in adjoining yards.

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[*] [The male was presented by Major C. B. Evan Smith, 15th August, 1873. The female was deposited by Mrs. Harris, 26 September, 1873.—Ed.]

[†] See also the specimen from Mocha figured by Mr. Blanford (Geol. and Zool. Abyss. p. 261, pl. i. fig. 3).

I propose to confer upon this species the name of *Gazella muscatensis*.

For the explanation of the terms used in the following description, and for the exact value I attach to the term "species" as applied to the different modifications of *Gazella*, I must refer to my former paper on the genus.

Gazella muscatensis, sp. nov. (Plate XXII.)

Hair very soft and long. Central facial band rufous fawn on the forehead, becoming darker as it descends, forming a distinct dark nose-spot. Light facial streaks very distinct, running over and stopping immediately above the eye, white; dark facial streaks distinct, black, becoming more rufous as they approach the angles of the mouth. Spot under and behind the eye, space round the muzzle, chin, throat, breast, belly and rump white. Dark lateral band very distinct, grizzly black. Knee-brushes and tail black. Neck and limbs below the carpal and tarsal joints fawn-colour, this colour being almost rufous on the limbs. Back, sides, and haunches silvery grey. Horns rather slender, compressed laterally, strongly and closely annulated, with their points in both sexes turned inwards and forwards. Ears long. Size inferior to that of *Gazella dorcas*.

Hab. Muscat.

A large number of skeletons of Gazelles received lately by Mr. Edward Gerrard from North-eastern Africa (which specimens Mr. Gerrard, with his usual kindness, has given me every facility for examining) have shown me an error in my former paper which I am anxious to take this opportunity of correcting. At page 552, I thus write:—"In no existing Gazelle have I as yet been able to discover the smallest trace of the external digits in either extremity." I now find from an examination of rough uncleaned specimens that in *Gazella sœmmeringii*, *G. lævipes*, and *G. isabella*, long filamentary second and fifth metacarpals are present, but no sign of the corresponding metatarsals. The unequal phalanges of the external digits of the hind extremities appear to be also represented. The delicacy and rudimentary condition of these bones causes them to be frequently lost in Museum specimens.

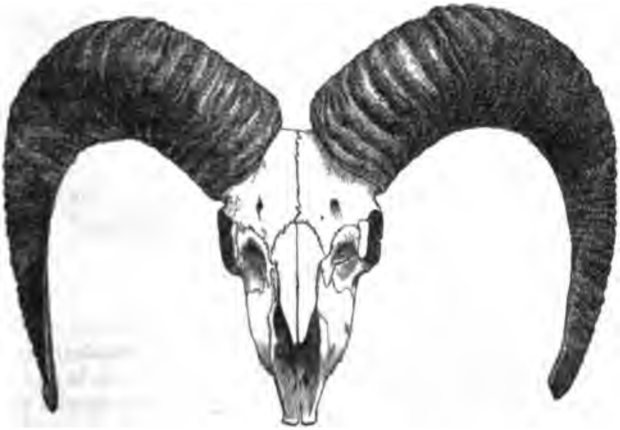
3. On a supposed new Species of Wild Sheep from Ladak.
By Edwin Ward, F.Z.S.

[Received January 20, 1874.]

The head and horns of the sheep I now exhibit, and for which I propose the name of "*Ovis brookei*," differs, in the opinion of the late Mr. Blyth, Sir Victor Brooke, myself, and others, from all heads of wild sheep with which it has been compared.

It is therefore believed that this head belongs to an undescribed animal, as the following measurements of the skull as well as those of the horns and character of the same may serve to show.

Fig. 1.



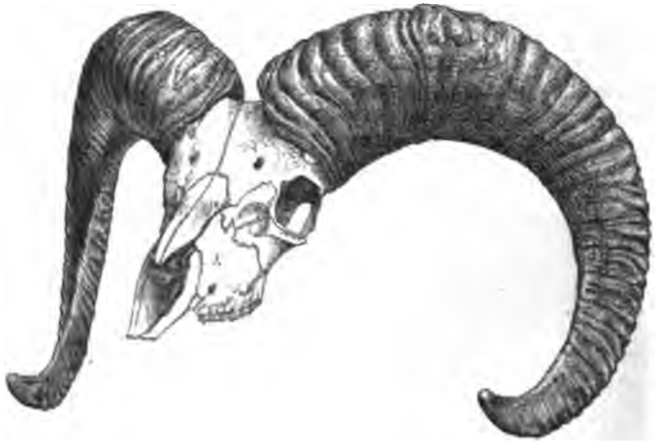
Front view of head of *Ovis brookei*.

The length of the skull of *O. brookei* from between the horns to end of the præmaxillæ is 11 inches, that being an inch and a quarter longer than in the two specimens named *O. vignei* in the College of Surgeons, and also in that of *O. vignei* here exhibited for comparison.

The width between the eye-orbits measures 4⅝ in., that of *O. vignei* 4¾ in. The horns of this specimen of *O. brookei*, although belonging to a young animal (as evinced by the teeth and the four progressive annual stages of the horns), measure 33½ in. in length, the circumference at base is 13⅜; that of *O. vignei*, eight years old, is 31½ in. in length, whilst round the base it is only 10½ in., *O. brookei* being therefore 3 in. the larger in circumference, as also 2 in. longer, although a much younger animal.

I find by an examination of the skull and horns of *O. vignei* in the Museum of the Royal College of Surgeons as before referred to, which are marked "3778" and described as "Ladak Argali (*O. vignei*) presented by Captain Strachey," as also of the specimen marked "3778 A," presented by Dr. Sclater, April 1868 (a figure of which appears in this Society's Proceedings for 1860, p. 127), that these specimens differ from *O. brookei* still more than the large specimen of *O. vignei* which I now exhibit.

Fig. 2.



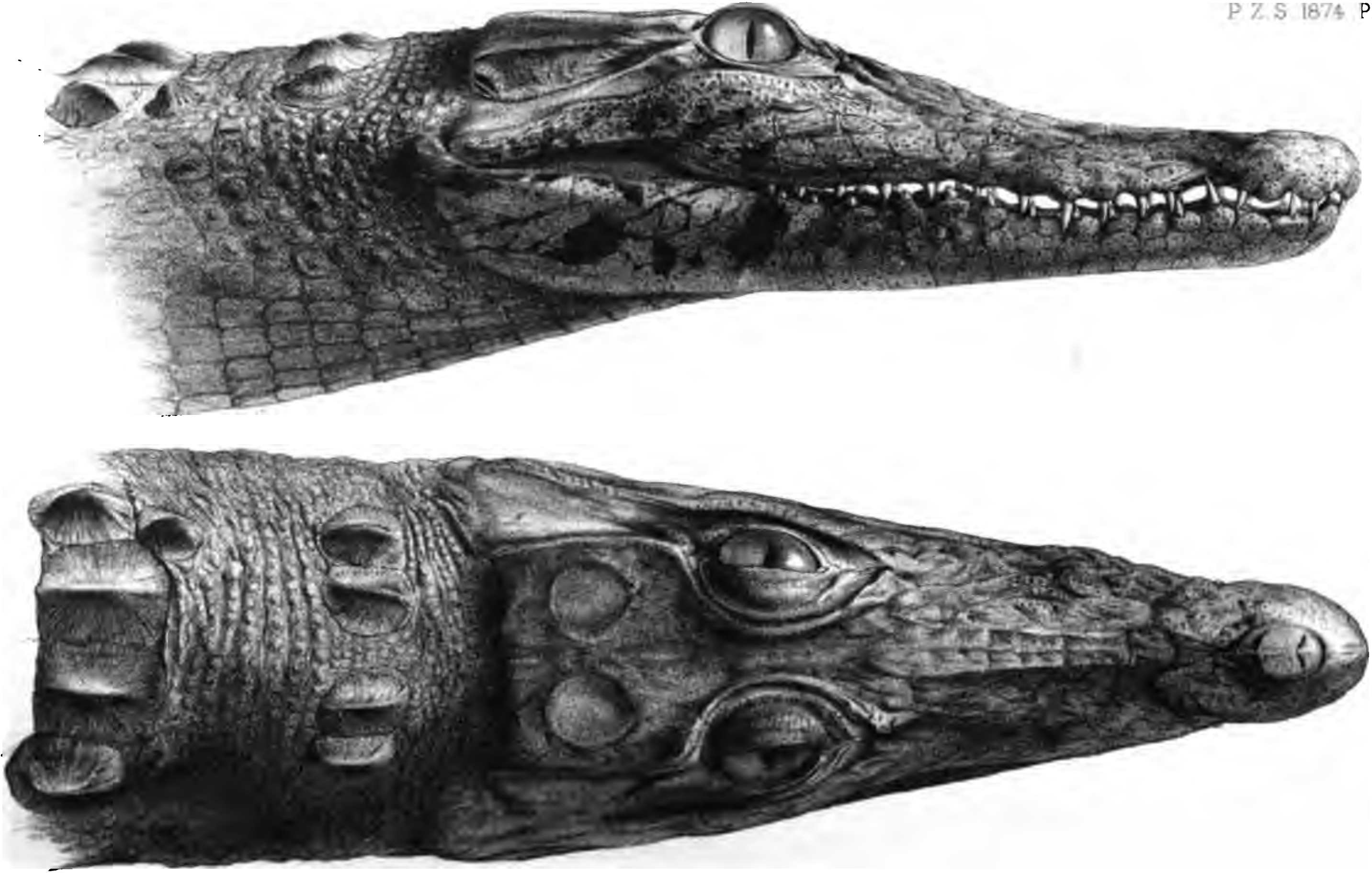
Horns of *Ovis brookei.*

In all the specimens Sir Victor Brooke and I have examined, we found that the suborbital fossæ in this species (*O. brookei*) are not nearly so deep or suddenly tucked in below the orbits as in *O. vignei* and *O. cycloceros*, as a glance at the skulls of these species which I exhibit will show. In this respect *Ovis brookei* more closely resembles *Ovis ammon* and *O. arkar.*

Again, the orbits also project much less, and the width of the parts below the orbits is greater in comparison to the length of the skull, in the new species than in either of the above. Likewise the greatly increased length of face gives altogether a very different outline, especially when viewed from the front.

Thus the new species shows generally a greater affinity to *O. ammon* of the Himalayas (or *Ovis hodgsoni*, as I believe it is now designated) than to any other form. And it may be said that in *O. brookei* the horns are not only more graceful, but also more largely and boldly ribbed and figured than even those of its gigantic and near ally; the length of the row of molar teeth also far exceeds the length of those of *O. vignei.*

Sir Victor Brooke, who is now visiting the chief museums of the continent of Europe, will, it is to be hoped, on his return to England, be enabled to favour us with further information concerning the species of *Ovis.*



G. H. Ford.

Mintern Bros. imp.

CROCODILUS MADAGASCARIENSIS.

Indeed, I may here remark that I have proposed the name *Ovis brookei* out of respect to the assiduous labours undertaken by that gentleman, who is now engaged in the production of a monograph of the sheep, illustrated by Mr. Wolf.

The head of this new Sheep now exhibited is believed to have been obtained by Sir Morrison Barlow some years since at Leh, in Ladak. It was parted with to a friend, from whom it subsequently passed, upwards of two years since, into my possession.

The late Mr. Blyth, who was so high and excellent an authority on sheep, was very desirous of describing the specimen which I have this evening brought before the Meeting; but I preferred to defer his doing so till I had obtained other heads. This I have not yet been able to accomplish; I, however, hope to do so shortly, and thus to be further enabled to supplement my remarks in support of this new species.

4. On *Crocodilus madagascariensis*, the Madagascar Crocodile.

By Dr. J. E. Gray, F.R.S. &c.

[Received January 30, 1874.]

(Plate XXIII.)

Cuvier, in the 'Ossemens Fossiles,' p. 44, mentions a specimen of a Crocodile from Madagascar, brought by M. Havet, and considers it the same as the one from continental Africa; I was inclined to do the same with two specimens of the young in spirits, which the Museum received as coming from Madagascar. Lately the British Museum has received a rather larger specimen direct from Mr. Lormier, who collected in Madagascar; and on comparing this specimen and the other two with specimens of *C. vulgaris* from continental Africa, of about the same size, I find that they all have the beak rather longer and slenderer compared with its breadth, and with straighter sides. At the same time, the sides of the lower jaw of all the specimens from Madagascar are pale and marbled with darker spots, and the sides of the abdomen of the larger stuffed specimens are marked with dark rounded spots placed in oblique cross lines—two peculiarities which I have not observed in any of the specimens from continental Africa. I am therefore inclined to think they indicate that the Crocodile which inhabits Madagascar is distinct from that which inhabits continental Africa; and I propose to call it *Crocodilus madagascariensis*.

I have seen it somewhere observed that the Crocodile of Madagascar is like the Crocodile from America, *Molinia acuta*; but this is a mistake; for although its head somewhat approaches in shape and proportion to that of *Molinia acuta*, its skull and the shields of the body are those of a true Crocodile.

The true Crocodiles have a cross series of four or six small occipital shields in a line, and a nuchal disk behind them of six larger keeled shields. The back has six regular longitudinal ridges of keeled shields, with one or two more or less distinct series of smaller keeled shields on the outside of the six larger ones. The two central keels of the shields are continued down the base of the tail to about the middle; the two lateral series of keeled shields are distinct for thirteen or fourteen cross series to just before the thighs, and at the fourteenth or fifteenth they are continued in a single series on each side of the tail, becoming much enlarged in the middle of the upper part of the tail, and then united into one central series of larger more compressed scales to the end of the tail.

The genus *Molinia* is known from *Crocodilus* by the dorsal shields being much more irregular. There are generally only two, rarely four, occipital shields, forming a cross line, the outer ones, when present, being smaller. The nuchal disk is formed of six large oblong keeled shields. The dorsal disk is formed of six longitudinal series of keeled scales: the two central series are the largest, but with bluntest keels; and they are continued to the base of the tail, when the keel becomes obliterated. The two lateral series are irregular, the inner one the largest, and it is continued over the top of the thighs, and down the side of the tail; the outer one is very irregular, interrupted, and with one or two small shields on the outside of it. This genus is at once known by the second series of shields on each side being continued along the side of the tail, and not the second and third on each side uniting and being continued along the side of the tail.

CROCODILUS MADAGASCARIENSIS. (Plate XXIII.)

The beak slender, elongate, with a slight ridge on each side of the central line, united just behind the nostrils. Sides of the lower jaw pale, with large irregular black spots.

C. vulgaris, var., Cuvier, Oss. Foss. p. 44; Gray, Hand-list Sh. Rept., p. 135. Specimens "*o*" and "*p*."

Hab. Madagascar. B.M.

There are three specimens of this Crocodile in the British Museum:—two in spirits, one (63. 5. 21. 4) purchased of the Zoological Society as *Crocodilus vulgaris*, and one (65. 3. 4. 5) of Mr. Stevens; also one stuffed 35½ in. long (73. 11. 10. 1), purchased of Mr. Higgins, collected by Mr. Lormier, who was lately accidentally burnt to death in Madagascar.

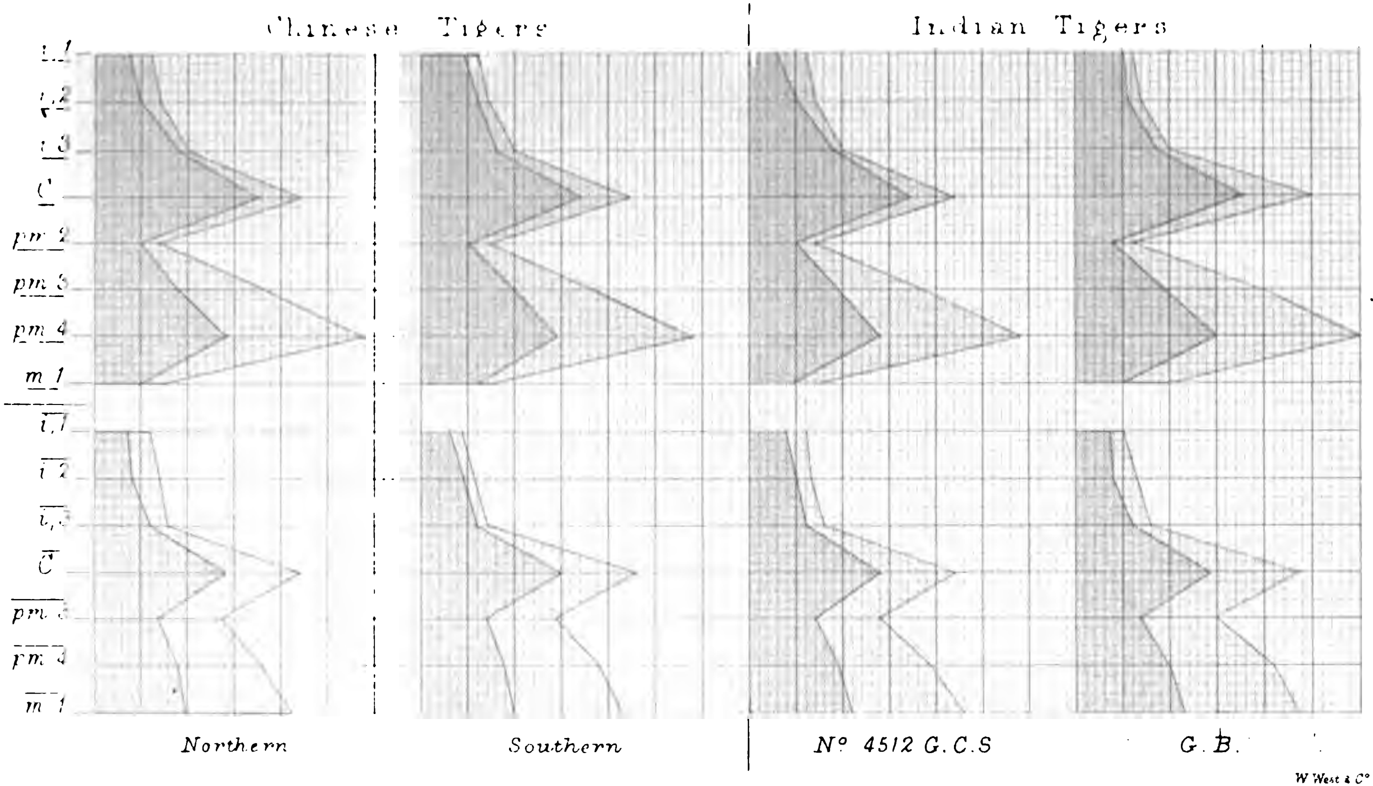
5. Note on the Cranial and Dental Characters of the Northern and Southern Tigers and Leopards of China as affording Marks of their Specific Distinction. By GEORGE BUSK, V.P.Z.S.

[Received February 17, 1874.]

(Plates XXIV. & XXV.)

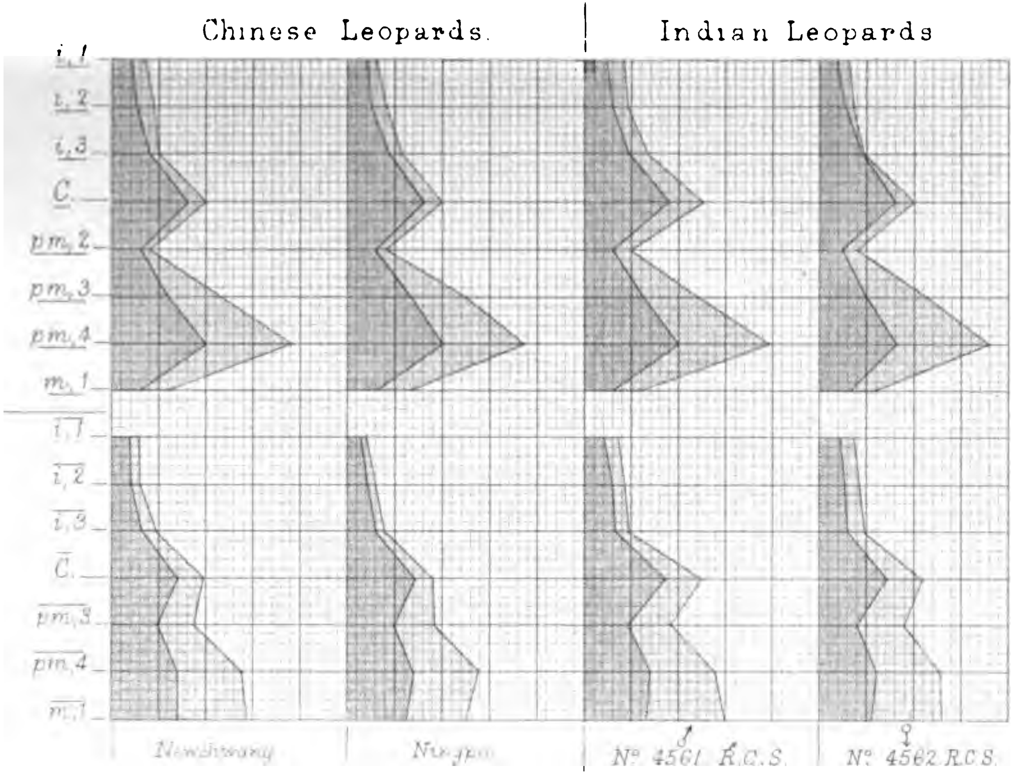
Mr. Robert Swinhoe has brought with him from China two Tiger skulls, one of which is, I believe, a unique specimen in Europe of the

P. Z. S. 1884. Pl. XXXV.



W. West & Co. lith.

Odontogram of Tigers



W West & Co. lith.

Odontogram of Leopards.

skull of the long-haired Mantchurian Tiger, and the other that of the form inhabiting the southern parts of the empire.

He has also procured skulls of the Leopards met with in the corresponding countries, and has been good enough to place the collection in my hands for comparison, and in order that the Society may have an opportunity of viewing them.

1. *Skulls of* Felis tigris.

One of these, upon which the soft parts in a dried state still remain so as somewhat to interfere with the examination, but not materially, is from Fychoo, 120 miles inland from Ningpo in the south of China; and the other, that of a Mantchurian Tiger, from Kirin, in the north of the empire. The latter was taken out of a long-haired skin, procured by the Governor of the port of Newchwang; so that, as Mr. Swinhoe states, there can be no doubt of its genuineness.

That from Fychoo belonged to a short-haired animal undistinguishable, in Mr. Swinhoe's opinion, from the Bengal Tiger.

He also states that the long-haired variety is so far adapted to a cold climate that in the winter it is observed to live in burrows under the snow.

The closest comparison I have been able to make between these two externally distinct varieties fails to indicate any thing approaching a specific distinction between them; nor, again, do they appear in any respect to differ, so far as the cranial and dental characters are concerned, from the Indian species.

2. *Skulls of* Felis leopardus.

The same may be said of the two Leopard skulls submitted to my inspection by Mr. Swinhoe.

One of these skulls is that of the species (or of a species) inhabiting the mountains near Ningpo, and regarded by Mr. Swinhoe as identical in every respect with the Indian Leopard; whilst the other was procured at the port of Newchwang from a native of the country. The latter, Mr. Swinhoe remarked to me, might probably be the *Felis fontanieri* of M. Alphonse Milne-Edwards*; but this is perhaps an erroneous impression. However this may be, in the cranial and dental characters at all events there is no appreciable distinction between the northern and southern forms brought by Mr. Swinhoe; and as further comparison of these skulls with that of the Indian Leopard only serves fully to confirm Mr. Swinhoe's opinion as to their identity with *Felis leopardus* of India, we are compelled to the conclusion that that species inhabits both the northern and southern parts of China, and is, like the Tiger, capable, with some modification of its fur, of enduring the rigours of the severe winter in the former region.

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* Ann. des Sc. Nat. 5^{me} sér. tom. viii., and 'Recherches pour servir à l'histoire naturelle des Mammifères,' p. 206, 1872.

M. Alphonse Milne-Edwards describes his *Felis fontanieri* from the neighbourhood of Pekin as possessing much longer and thicker hair than the common species, and a remarkably bushy tail. But more important distinctive characters adduced by him are those presented by the skull: he states that in *F. fontanieri* the cranium is much more arched in the antero-posterior direction than it is in the African and Indian Panther, and that the brain-case proper is comparatively more developed, especially in width; the fronto-nasal region is more elongated, the posterior border of the palate deeply notched within the tubercular teeth, and the opening of the posterior nares short and wide. As none of these characters applies to the Newchwang Leopard's skull as compared with that from Ningpo, it is clear that we cannot regard the former as *F. fontanieri*, A. M.-Edw.; and we may perhaps, in the absence of fuller information respecting the latter, be led to the conclusion suggested by M. A. Milne-Edwards that there are two distinct species of Leopards in China, both of which, according to M. Fontanier, are found in the neighbourhood of Pekin.

In order to render the evidence clear upon which I have gone, I have subjoined a Table showing the comparative measurements of the skulls and teeth in the Chinese as contrasted with the Indian Tigers and Leopards*.

I have also appended (Plates XXIV. & XXV.) *odontograms*, or graphic representations, of the dimensions and proportions of the teeth in the various forms—a glance at which will alone suffice to show how close the resemblance in these essential particulars is in the respective species, the slight differences observable being clearly merely individual variations†.

To judge from the figure of the skull of *Leopardus chinensis*, Gray (P. Z. S. 1867, p. 264), and the brief description accompanying it, that species would appear to have a strong resemblance to those brought by Mr. Swinhoe—the principal difference, so far as I can perceive, being the comparatively rather smaller size of *L. chinensis*.

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* Comparison of the various dimensions of the skull of *F. fontanieri* given in Table II. would lead to the conclusion that that species does not materially differ from *F. leopardus*.

† The construction of these figures will be found explained in the 'Proc. Roy. Soc.' no. 122, vol. xviii. p. 544. But to save trouble I would merely remark that each horizontal line represents the length and breadth of the antero-posterior and transverse diameters of a tooth, the latter diameter being indicated by the dark shade. The scale is divided into $\frac{1}{20}$ths of an inch (0''·05).

TABLE I.—*Table of Cranial and Dental Measurements of Tigers and Leopards.* (Measures given in hundredths of an inch.)

Animals.	Extreme length.	Length from posterior border of condyles.	Height.	Width at zygomata.	Width at auditory foramina.	Postorbital width.	Interorbital width.	Width of condyles.	Greatest diameter of orbit.	Length and breadth of nasals.	Length and breadth of premaxillaries.	Length of palate.	Length and breadth of palatals.	Width of maxilla outside m. 1.
Mantchurian Tiger	1350	1210	370	880	440	240	270	225	280	440×220	380×260	600	250×320	530
Pychoo Tiger	1370	1210	360	880	480	250	270	240	250	480×220	?	610	?	550
Bengal Tiger (4512 c, R. C. S.)	1410	...	...	...	...	...	290	...	250	450×230	330×260	600	250×350	540
Bengal Tiger (G. B.)......	0	0	370	950	0	270	285	0	275	460×230	367×270	600	270×340	530
Ningpo Leopard	730	715	235	500	300	150	140	170	162	230×120	180×140	325	150×210	300
Newchwang Leopard ...	740	685	250	520	310	150	135	155	170	230×130	180×120	300	140×220	300
India, ♂ (4561, R. C. S.).	850	760	230	530	325	155	145	165	175	260×140	210×160	...	...	...
India, ♀ (4562, R. C. S.)	760	670	225	480	275	160	135	150	165	230×120	190×130	300	140×210	300
India?, ♂ (4541, R. C. S.)	730	680	220	500	300	175	141	150	165	225×125	190×140	310	120×190	310
? (4541 A, R. C. S.)	940	830	235	575	330	175	160	170	190	260×140	200×165	370	162×225	330
? (4541 B, R. C. S.)	810	710	230	510	315	175	140	155	170	245×130	220×150	320	135×210	320
W.C. Africa (4540, R. C. S. *F. pardus*)	970	850	266	540	340	132	150	190	190	300×150	240×162	420	185×205	330

Animals.	Width behind canines.	Length of incisor series.	Outer incisor.	Canine.	Pm. 2.	Pm. 3.	Pm. 4.	M. 1.	Length of mandible.	Height of coronoid process.	Width from outsides of condyles.
Mantchurian Tiger	370	185	50×45	110×85	32×25	90×45	145×70	35×23	875	435	780
Pychoo Tiger	380	170	50×40	110×85	35×25	92×50	142×72	35×27	875	440	780
Bengal Tiger (4512 c, R. C. S.)	390	...	55×41	120×83	30×25	95×45	150×75	50×25	850	460	820
Bengal Tiger (G. B.) ...	390	170	50×42	125×87	30×20	100×47	150×75	55×25	880	520	810
Ningpo Leopard	195	85	28×21	48×40	20×15	60×32	91×50	32×15	500	240	440
Newchwang Leopard ...	210	86	25×20	47×37	20×15	57×30	95×50	30×15	465	250	450
India, ♂ (4561, R. C. S.)	...	100	35×25	60×45	22×15	60×30	95×50	30×15	530	260	475
India, ♀ (4562, R. C. S.)	205	80	22×22	50×40	20×16	57×25	90×40	30×15	470	240	430
India?, ♂ (4541, R. C. S.)	200	98	30×20	50×40	20×15	56×30	90×45	25×10	500	240	440
? (4541 A, R. C. S.)	240	105	27×24	65×45	25×17	67×31	95×50	32×15	570	310	550
? (4541 B, R. C. S.)	208	100	28×25	60×45	25×15	65×37	95×50	30×15	500	270	475
W.C. Africa (4540, R. C. S. *F. pardus*)	230	100	35×22	85×64	0	75×35	100×57	35×15	630	310	520

TABLE I. (*continued*).

Animals.	Width behind canines.	Length of diastema.	Length of symphysis.	Length of condyle.	Incisor series.	Outer incisor.	Canine.	Pm. 3.	Pm. 4.	M. 1.	Cranial capacity (cubic inches).
Mantchurian Tiger	215	130	330	230	140	37×30	110×70	65×33	93×45	105×50	19·5
Fychoo Tiger	?	130	360?	220	135	33×30	110×75	70×35	95×42	105×50	19·5
Bengal Tiger (4512 c, R. C. S.)	210	120	330	220	...	35×35	110×70	70×35	97×50	110×55	?
Bengal Tiger (G. B.) ...	210	100	380	235	135	40×30	122×75	74×34	105×50	117×56	?
Ningpo Leopard	110	60	150	110	65	20×15	45×35	46×24	70×35	62×30	9·0
Newchwang Leopard ...	115	55	137	120	70	20×15	47×35	45×26	68×35	70×35	9·8
India, ♂ (4561, R. C. S.)	120	60	160	125	80	26×16	65×40	45×24	70×35	76×32	
India, ♀ (4562, R. C. S.)	110	50	145	110	60	26×15	52×35	45×20	68×30	65×27	
India?, ♂ (4541, R. C. S.)	110	60	145	175?	70	20×15	52×35	40×22	60×30	60×28	
? (4541 A, R. C. S.)	130	61	170	140	80	25×17	60×40	50×25	72×35	75×30	
? (4541 B, R. C. S.)	120	50	150	130	70	26×16	57×38	48×24	72×38	76×31	
W.C. Africa (4540, R.C.S. *F. pardus*)	125	80	200	142	80	17×17	65×50	50×25	80×35	75×37	

TABLE II.—*Principal Dimensions, noted by M. A. Milne-Edwards, of* Felis fontanieri (*A. M.-Edw.*), *with some others for comparison.* (Measures in millimetres.)

Animals.	Extreme length of skull.	Length from anterior border of foramen magnum to incisive border.	Length of palate.	Width behind orbits.	Extreme width of skull.	Width of maxilla at canines.	Interorbital width.	Distance between tubercular molars.	Molar series.	Length of mandible.	Height of coronoid process.	Height from angle to upperside of condyle.	Molar series.	Extreme length of molar.	Length from centre of auditory foramen to point of zygomatic process of temporal.	Length of maxilla from summit to canine alveolus.	Width at zygomata.
Chinese, Northern	187	161	78	38	75	50	34	60	45	118	65	27	44	73	64	67	131
Chinese, Southern.........	185	163	82	38	71	51	36	61	47	124	52	26	45	68	70	71	127
F. fontanieri	180	153	80	39	73	51	32	60	47	120	55	23	45	75*	64*	63*	?
Indian Leopard (4561)...	215	177	90	39	70	56	36	65	47	134	65	26	47	77	70	79	131
Indian Leopard (4562)...	192	152	78	40	71	50	34	65	42	118	60	26	44	71	60	72	121
Leopardus chinensis (Gray)	175	116															

March 3, 1874.

Dr. E. Hamilton, Vice-President, in the Chair.

The following report by the Secretary on the additions to the Society's Menagerie during the month of February 1874 was read:—

The total number of registered additions to the Society's Menagerie during the month of February 1874 was 54, of which 4 were by birth, 16 by presentation, 20 by purchase, 3 by exchange, and 11 received on deposit. The total number of departures during the same period, by death and removals, was 91.

The most noticeable additions during the month were:—

1. A Malayan Hornbill (*Buceros malayanus*), purchased February 17, 1874; new to the Society's collection, this fine species not having been previously received alive.

2. A Python (*Python molurus*), transmitted to the Society by Mr. Charles James Noble, of Hong-kong, having been caught in his garden on the Chinese mainland, about two miles from Hong-kong.

3. A young male Deer from Northern China, purchased February 27th, 1874. This Deer is evidently the representative in China of *Cervus sika* of Japan, which it resembles in general habit, though the present example is slightly smaller in stature. It is readily distinguishable, however, from its Japanese ally by its dark reddish face and perfectly white tail and buttocks. Mr. Swinhoe communicated to us a description of this species in June last year, along with that of *Cervus kopschi* (see P. Z. S. 1873, p. 572). Subsequently he requested me to withdraw the description, not being quite certain as to its distinctness from *Cervus sika* of Japan. There can, however, I think, be little doubt of the species being distinct from *Cervus sika*, although it is certainly very closely allied to the smaller form of *Cervus mantchuricus*, which we have lately received specimens of from Japan. I therefore gladly adopt for it as a temporary designation Mr. Swinhoe's name, *Cervus euopis*, under which it has already been distinguished in the printed minutes of this Society of the 17th of June last.

Mr. Swinhoe has favoured me with the following notes on this Deer:—

"In Mr. Vraard's gardens at Shanghai, in an enclosure with a doe *C. sika* from Japan, was a horned brown buck, which on first glance I took for a buck of the same species in winter coat. Mr. Vraard assured me that the animal was from Newchwang; he had had it three years, and it never got spotted in summer, its hair merely changing to a shorter coat of polished brown. This was on the 27th of March of last year, when its pile was long and somewhat shaggy at the throat; its eye large, and well open towards fore *canthus*, with scarcely any lachrymal slit; the muzzle large, and confluent with the upper lip; the head short, narrow at the snout, broad at the eyes, with large ears, pale round eyes and on forehead, abounding in long bristles about snout above and below, and about eyelids above and below. The horns were four-pronged, slender, and short in spaces between snags. The general coat was dark brown, with a darker line down back terminating in a white patch on rump and a white tail. The tarsal patch was large, and consisted of close short hair. A black spot occurred below each lower lip, uniting by a central line with a similar spot on the chin. The animal had a wiry active look, and, I was told, was a fine runner and jumper when out of the enclosure.

"I was convinced it was a new species, and sent home a description of it to the Secretary of this Society, in company with that of *Cervus kopschi* from Kiukiang. Meanwhile, on learning the name of the gentleman who was said to have procured it at Newchwang, I sent to ascertain whether such an animal had been noticed at that port. No one knew any thing about it; and the gentleman himself declared that he did not recollect the purchase. I feared then that there might be some mistake, and that this specimen was merely an individual variety of *C. sika*. I wrote this to the Secretary, and begged him for the present to cancel my species.

"The other day I heard from my friend Mr. A. Michie, at Shanghai, that he had been so fortunate as to procure two bucks of the same Deer, which had just arrived in a ship from Tientsin, and that he had at once shipped them for England in the steamer 'Deucalion.' One died on the passage; the other arrived safe and well, and has been acquired by the Society, in whose Gardens it is now to be seen."

4. Two males of the beautiful Falcated Teal (*Querquedula falcata*), which arrived along with the Deer above mentioned, and are, I believe, quite new to European collections.

A letter was read from Sir Henry Barkly, Corresponding Member, dated Government House, Cape Town, January 26, 1874, stating that he had obtained from Robben Island, in Mossel Bay, a pair of young Eared Seals, *Otaria pusilla*, and proposed to send them to the Society by the next Union Company's steamer.

Sir Henry was also hoping to get an Elephant Seal (*Morunga proboscidea*) from the Crozettes, having arranged with Professor Wyville Thomson, who had proceeded there with the 'Challenger' Expedition, to endeavour to procure one, and send it up either alive or dead.

As regards the White Rhinoceros (*Rhinoceros simus*), concerning which the Secretary had been in correspondence with him, Sir Henry almost despaired of getting one, on account of the vast distance in the interior from which such an animal could now only be procured.

The following papers were read:—

1. Notes on the Procreant Instincts of the three Species of *Molothrus* found in Buenos Ayres. By W. H. Hudson, C.M.Z.S.

[Received January 9, 1874.]

About three years ago I wrote two letters to the Secretary on the habits of the various species of the genus *Molothrus* found in this country. Since that time I have continued my observations on these interesting birds, and have now great pleasure in submitting to the Society the following notes regarding their procreant instincts.

I. *"Mistakes and imperfections" of the instinct of* Molothrus bonariensis.—1. The *M. bonariensis* frequently wastes its eggs by dropping them upon the ground. 2. They also occasionally lay eggs in old forsaken nests: this I had often observed; and, to make assurance doubly sure, last summer I fixed several old nests up in trees and bushes, and found that eggs were laid in them. 3. They also frequently lay in nests where incubation has actually begun. When this happens the egg of the *M. bonariensis* is lost if incubation is very far advanced; but if the eggs have been sat on three or four days only, then the parasitical egg has a good chance of being hatched, and the young bird reared along with its foster-brothers. I have often found nests of the Yellowbreast (*Pseudoleistes virescens*) and of the Scissor-tail (*Milvulus violentus*) containing fledged young of both species.

4. One female will often lay several eggs in the same nest, instead of laying but one, as does, according to Wilson, the *Molothrus pecoris* of North America. I conclude that this is the case from the fact that in cases where the eggs of a species vary considerably in form, size, and markings, each individual of the species lays eggs precisely or nearly alike. So when I find two, three, or four eggs of the *M. bonariensis* peculiar in form and size, also alike in coloration and disposition of spots, in one nest, and yet, in half a hundred eggs out of other nests, cannot find one to match with them, it is impossible not to believe that the eggs found together, and possessing so strong a family likeness, were laid by the same bird.

5. Several females often lay in one nest; so that the number of eggs in it frequently makes incubation impossible. It occurred to me this summer (December 1872) to count the eggs of *M. bonariensis* in several nests, in order to ascertain the average number deposited in each nest—thence the wasted eggs; for more than one bird is seldom reared. I obtained ten nests of *Milvulus violentus* and give the result (see page 154).

It is worthy of remark that the *Milvulus* lays in October or early in November, and rears but one brood in the season; consequently these ten nests, obtained late in December, are of birds whose first nests had been lost. Probably three fourths of the lost nests of the *Milvulus* are abandoned in consequence of the confusion caused in them by the *Molothrus bonariensis*.

Nests of *Milvulus violentus.*	Eggs in each.	Of *Milvulus violentus.*	Of *Molothrus bonariensis.*
1st...............	9	1	8
2nd	3	3	0
3rd	2	0	2
4th	7	2	5
5th	5	1	4
6th	3	3	0
7th	4	0	4
8th	6	1	5
9th	4	0	4
10th	4	1	3
	47	12	35

Thus of forty-seven eggs found in ten nests thirty-five were parasitical!

6. The female *M. bonariensis*, and sometimes the male, destroy many of the eggs in the nests they intrude into, by pecking holes in the shells, breaking, devouring, or stealing them. This is the most destructive habit of the bird, and is probably possessed by individuals in different degrees; for sometimes one nest appears exempt whilst others are completely ruined by it. I have often carefully examined all the parasitical eggs in a nest, and after three or four days discovered that these eggs had disappeared, others newly laid being found in their places. The large number of Scissor-tails' nests containing no eggs of the Scissor-tail, even after incubation has began, shows how many eggs must be removed or devoured; for the *M. bonariensis* destroys indiscriminately the eggs of its own species and those of others.

II. *Advantages of this instinct.*—After a perusal of the preceding note one might ask, If there is so much that is defective and irregular in the reproduction of the *M. bonariensis*, how can the species maintain its existence, and even increase to such an amazing extent? for it is certainly more numerous, over an equal area, than other parasitical species. For its being more abundant than other species with analogous but apparently more perfect instincts, there may be many reasons unknown to us. The rarer species may be less hardy, have more enemies, be exposed to more perils in their long migrations, &c. But for its being able to maintain its existence there is a very obvious reason, viz. in the many circumstances giving its egg and young an advantage over the eggs and young of the species it is parasitical on. Some of these favourable circumstances are derived from those very habits of the parent bird that at first sight appear most defective; others from the character of the egg and embryo, time of evolution, &c.

1. The egg of the *M. bonariensis* is usually larger, and almost invariably (the one exception I know being the eggs of the Yellow-breast) much harder-shelled than are the eggs with which it is placed. Now the greater hardness of the shell of its own eggs considered in relation to the destructive egg-breaking and -stealing

habits of the bird, gives its own egg the best chance of being preserved; for though the *Molothrus* never distinguishes its own eggs, of which indeed it destroys many, those with soft shells have the poorest chance of being preserved whenever several in the nest are indiscriminately broken.

2. The vitality or tenacity of life appears greater in the embryo *M. bonariensis* than in other species; this circumstance also, in its relation to the egg-breaking habit and to the habit of laying many eggs in a nest, gives it a further advantage. I have examined nests of the Scissor-tail containing a large number of eggs, after incubation had began, and have been surprised at finding all the eggs of the Scissor-tail addled, even when they were placed most advantageously in the nest for receiving the heat of the sitting bird; whilst those of the *M. bonariensis* contained living embryos, even when under all the other eggs, and, as frequently happens, glued immovably to the nest by the matter of broken eggs spilt over them before incubation had commenced.

3. The comparatively short time the embryo takes to hatch gives it another and a great advantage; for, whereas the eggs of other small birds require to be sat on from fourteen to sixteen days, that of *M. bonariensis* hatches in eleven days and a half from the moment incubation commences; so that when the female *M. bonariensis* makes so great a mistake as to lay an egg with others that have already been sat on, if incubation is not far advanced, her egg has still a chance of being hatched before or contemporaneously with the others; but even if the others hatch before it, the extreme hardiness of the embryo serves to keep it alive with the modicum of heat which it still receives from the foster-bird.

4. Whenever the *M. bonariensis* is hatched together with the young of its foster-parents, if these are smaller than the parasite (and in most cases they are smaller), soon after exclusion from the shell they disappear, and the young *M. bonariensis* remains sole occupant of the nest. How the latter succeeds in expelling or destroying them, if he indeed does destroy them, I have not been able to learn.

To all these circumstances favourable to the *M. bonariensis* may be added another of equal or greater importance. The *M. bonariensis* never being engaged with the dilatory and exhaustive process of rearing its own young, and for this reason continuing in better condition than other birds, and moreover being gregarious and practising promiscuous sexual intercourse, must lay a vastly greater number of eggs than other species. In our domestic fowls we see that hens that never become broody frequently lay many dozens of eggs more in a season than others. Some of our small birds rear two, others but one brood in a season—building, incubation, and tending the young taking up much time, so that they are usually from two to three months and a half employed. But the *M. bonariensis* is like the fowl that never incubates, and continues dropping eggs over four months and a half. From the beginning of September till the end of January the males are seen incessantly wooing the females; and during most of this time the eggs are found. I find that small birds will, if deprived repeatedly of their nests, lay and even hatch four times in the season, thus laying, if the full complement be four, sixteen eggs. Probably the *M. bonariensis* lays at least twice (perhaps four times) that number. Before dismissing the subject of the advantages this species possesses over those that are its dupes, and of the real or apparent defects of its instinct, some attention should be given to another circumstance, viz. the new conditions introduced by civilized man, and their effect on the species. The effect of these altered conditions has been to make the species more numerous, and, by the removal of certain extraneous checks, to increase excessively those irregularities that must be concomitants of a parasitical instinct like that of this *Molothrus*.

The procreant habits of *M. bonariensis* do in reality appear different in wild regions (where they were formed) from what they do in cultivated ones. In the former the birds are much rarer; and it is, in such regions, an uncommon thing to find its eggs, and nests are there probably never overburdened with them. But in cultivated regions the birds congregate in orchards and plantations in great numbers, and avail themselves of all the nests, ill concealed as they must ever be in the clean and open-foliaged trees planted by man.

III. *Diversity in colour of eggs.*—An extraordinary circumstance in connexion with the reproduction of *M. bonariensis* is the diversity in the coloration of its eggs; I have heard of no other species laying eggs so varied. Perhaps as many as half the eggs, or nearly half, are pure unspotted white, like the eggs of most birds that lay in dark holes. Others there are sparsely marked with such exceedingly smooth specks of pale pink or grey, as to appear quite spotless until very closely examined. After the entirely white, the most common variety is an egg with white ground thickly and uniformly spotted or blotched with red. Perhaps the rarest variety is an egg entirely of a fine deep red. But between this lovely marbled egg and the white one with almost imperceptible specks, there is an infinite number of varieties; for there is no such thing as "certain characteristic markings" in the eggs of this species, though, as I have already inferred, the eggs of the same individuals closely resemble each other. I will mention two more of the beautiful varieties:—one pure white with a few large or variously sized chocolate spots; another, not uncommon, with a very pale flesh-coloured ground, thickly and uniformly marked with fine characters, that appear as if inscribed on the shell with a pen.

This summer (1872–3) I have found five nests of the Yellowbreast (*Pseudoleistes virescens*). The first three nests were abandoned soon after being completed, owing to the confusion caused by the *M. bonariensis*, that began laying and breaking eggs in the nests before the Yellowbreast had laid any. The fourth nest was in a cardoon bush, and contained nine eggs, four of the Yellowbreast and five of the *M. bonariensis*: two of the parasitical eggs were pure white; the others were mottled. The fifth nest, also in a cardoon bush, contained five eggs—two of the Yellowbreast, and three parasitical. These three were of the variety most thickly mottled with red and consequently closely resembling the eggs of the Yellowbreast. I was surprised to find five more eggs of *M. bonariensis* on the ground, near together and about three feet from the bush; these five eggs were all pure white and spotless. Naturally I asked, How came these eggs on the ground? They had not fallen from the nest, which was very deep; this one contained few eggs, and was scarcely 30 inches from the ground. Then they were all white, while those in the nest were mottled. That the eggs had been laid in the nest I was quite sure; and the only way I can account for their being in the place I found them, is that the Yellowbreast itself removed them, taking them up in the bill and flying to the ground. If I am right we must believe that this individual Yellowbreast had strongly developed an instinct unusual to the species, by which it is able to distinguish, and cast out of its nest, eggs very different from its own—an instinct, in fact, the object of which would be to counteract the parasitical instinct of the *Molothrus*. What would be the effect of such an instinct should the species acquire it? Doubtless it would be very prejudicial to all the parasitical birds that laid white eggs, but those that laid mottled eggs would be preserved. This would be natural selection operating in a very unusual manner; for the Yellowbreast, or other species, would improve another to its own detriment, because the more the parasitical eggs resembled its own the better chance would they have of being preserved. But, it may be added, if besides the Yellowbreast some one other species laying very different eggs (a *Zonotrichia* or *Tyrannus* for instance) should also acquire this distinguishing-habit and eject all eggs differing greatly from its own from its nest, the instinct in two species would ultimately cause the extermination of the parasite. Some light might be thrown on this obscure subject by examining for two or three summers a large number of nests, to ascertain if the nests of the Yellowbreast are often found without any white eggs, or if the same proportional number of white (parasitical) eggs are found in the nests of the Yellowbreast, Scissor-tail, *Sturnella*, and other species.

IV. *Habits of young* M. bonariensis.—Little birds of all species when just hatched closely resemble each other; after they are fledged the resemblance is less, but still comparatively great; grey interspersed with brown is the colour of most of them, or at least of the upper exposed plumage. There is also a great similarity in their cries of hunger and fear—shrill, querulous, prolonged, and usually tremulous notes. It is not to be wondered at, then, that the foster-parents of the young *M. bonariensis* so readily respond to its cries, understanding the various expressions denoting hunger, fear, or pain, as well as when uttered by their own offspring. But the young *Molothrus* never understands the language of its foster-parents as other young birds understand the language of their real parents, springing up to receive food when summoned, and concealing themselves or striving to escape when the warning note is given. Again the young *Molothrus* does not learn to distinguish, even by sight, its foster-parents from any other bird approaching the nest. It generally manifests no fear even at a large object. On thrusting my fingers into any nest, I find the young birds, if still blind or but recently hatched, will hold up and open their mouths expecting food; but in a very few days they learn to distinguish between their parents and other objects approaching them, and to show alarm even when not warned of danger. Consider the different behaviour of three species that seldom or never warn their offspring of danger. The young of *Synallaxis spixii*, though in a deep domed nest, will throw itself to the ground, attempting thus to make its escape. The young of *Mimus patagonicus* sits close and motionless with closed eyes mimicking death. The young of our Dove, even before it is fledged, will swell itself up and strike angrily at the intruder with beak and wings; and by making so brave a show of its inefficient weapons it probably often saves itself from destruction. But any thing approaching the young *Molothrus* is welcomed with fluttering wings and clamorous cries, as if all creatures were expected to minister to its necessities.

December 24, 1872.—To-day I found a young *Molothrus* in the nest of *Spermophila ornata*; he cried for food on seeing my hand approach the nest; I took him out and dropped him down, when, finding himself on the ground, he immediately made off, half-flying. After a hard chase I succeeded in recapturing him, and began to twirl him about, making him scream so as to inform his foster-parents of his situation; for they were not by at the moment. I then put him back in, or rather upon, the little cradle of a nest, and plucked half a dozen large measure-worms from an adjacent twig. The worms I handed to the bird as I drew them from the cases; and with great greediness he devoured them all, notwithstanding the ill-treatment he had just received, and utterly disregarding the wild excited cries of his foster-parents, just arrived and hovering within three or four feet of the nest.

Last summer (1871–2) I noticed a young *M. bonariensis* in a stubble-field, perched on the top of a slender dry stalk; as it was clamouring at short intervals, I waited to see what bird would come to it. It proved to be the diminutive *Polioptila dumicola*; and I was much amused to see the little thing fly directly to its great foster-offspring and, alighting on its back, drop a worm into the upturned open mouth. After remaining a moment on its singular perch the *Polioptila* flew away, but in less than half a minute returned and perched again on the young bird's back. I continued watching them until the *Molothrus* flew off, but not before I had seen him feed seven or eight times in the same manner.

In the two foregoing anecdotes may be seen the peculiar habits of the young *M. bonariensis*. As the nests in which it is hatched, from those of the little *Serpophaga* and Wren to those of *Mimus*, vary so much in size and materials, and are placed in such different situations, the young *M. bonariensis* must have in most of them a somewhat incongruous appearance. But in the habits of the young bird is the greatest incongruity or inadaptation. When the nest is in a close thicket or forest, though much too small for the bird, and although the bird itself cannot understand its foster-parents, and welcomes all things that, whether with good or evil design, come near it, the unfitness is not so apparent as when the nest is in open fields and plains.

The young *M. bonariensis* differs from the true offspring of its foster-parents in its habit of quitting the nest as soon as it is able, trying to follow the old bird, and placing itself in the most conspicuous place it can find, such as the summit of a stalk or weed, and there demanding food with frequent and importunate cries. Thus the little *Polioptila* had acquired the habit of perching on the back of its charge to feed it, because parent birds invariably perch above their young to feed them; and the young *M. bonariensis* prevented this by always sitting on the summit of the stalk it perched on. The habit is most fatal on the open and closely cropped pampas inhabited by the Cachila (*Anthus correndera*). In December, when the Cachila rears its second brood, the *Milvago chimango* also has young, and feeds them almost exclusively on the young of other, chiefly small, birds. At this season the Chimango destroys great numbers of the young of the Cachila and of *Anumbius rufigularis*. Yet these birds are beautifully adapted in structure, coloration, and habits to their station. It thus happens that in districts where the *Molothrus* is abundant, their eggs are found in a majority of the Cachilas' nests: and yet to find here a young *M. bonariensis* out of the nest is a rare thing; for as soon as they are able to quit the nest and expose themselves they are all or nearly all carried away by the Chimango.

V. *Nidification of* Molothrus badius.—A pair of Leñateros (*Anumbius acuticaudatus*) have been nearly all the winter building a great nest on a locust-tree within sixty yards of the house. This nest is about 27 inches deep and 16 or 18 in circumference, and appears now nearly completed. To-day (September 28, 1872) I saw a bay-winged *Molothrus* on the nest; it climbed about it, deliberately inspecting every part, taking up and rearranging some sticks and throwing others down. Whilst thus engaged, two Blackbirds (*M. bonariensis*), male and female, came to the tree; the female dropped into the nest, and began also to examine it, peering curiously into the entrance and quarrelling with the first bird. After a few minutes she flew off followed by her consort. The Bay-wing continued its strange futile work until the owners of the nest appeared, whereupon it hopped leisurely to one side, sung for a few moments, and then flew away. The similarity in the behaviour of the two birds struck me very forcibly; in the great interest they take in the nests of other birds, especially in large covered nests, the two species are identical. But when the breeding-season has come their habits begin to diverge: then the *M. bonariensis* lays in nests of other species, abandoning its eggs to their care; whilst the Bay-wings usually seize on the nests of other birds, and rear their own young. Yet, as they do occasionally build a neat elaborate nest for themselves, the habit of taking possession of nests of other birds is probably recently acquired; probably also its tendency is to eradicate the primitive building-instinct.

October 8, 1872.—This morning, whilst reading under a tree, my attention was attracted by a shrill note, as of a bird in distress, issuing from the Leñatero's nest; after having heard it repeated at intervals for more than twenty minutes I went to ascertain the cause. The Bay-wings flew up from the ground under the nest; and on searching in the rank clover that grew under the tree I discovered the female Leñatero with plumage wet and draggled, tumbling and appearing half dead with the rough treatment she had experienced. I put her in the sun; and in about half an hour's time, hearing her mate calling, she managed to flutter feebly away and joined him. The persecutors had evidently dragged her from the nest, and probably would have killed her had I not come so opportunely to the rescue. Since writing the above I have watched the nest every day. Both the Bay-wings and Leñateros had left it; within a week's time the owners of the nest returned and resumed possession. Three or four days afterwards the Bay-wings also came back; but on finding the nest still occupied they took possession of an unfinished oven of the Oven-bird on a separate tree within twenty yards of the nest, and immediately began carrying in materials to line it with. After having left them time sufficient to finish laying, I took their five eggs, at the same time throwing down the oven, and waited to see what the next move would be. They remained on the spot singing incessantly and manifesting anxiety when approached. I observed them four days, and was then away from home as many more; on returning I found the Leñateros had disappeared and their great nest was again held by the Bay-wings. I also noticed that the latter had opened an entrance at the side of the nest and near the bottom; for the receptacle of the eggs is placed at the lower extremity, and is reached by a narrow covered passage from the top. It was now about the end of October, the height of the breeding-season, and numbers of Blackbirds constantly visited the nest; but I was particularly interested in a pair of the *M. rufoaxillaris* that had also begun to grow fond of this nest, the theatre of so much contention, and I resolved to watch these birds very closely. As these last birds spent so much of their time near the nest, showing great solicitude whenever I approached it, I thought perhaps they would take possession and breed in it could the Bay-wings be driven out. I therefore waited patiently, giving the Bay-wings time to lay the full complement of eggs; for I did not wish to shoot them, and believed that when they found themselves deprived a second time of their eggs they would certainly decamp.

In a few weeks time I climbed to the nest, and found, very much to my astonishment, ten eggs, instead of four or five as I had confidently expected. All these eggs were of the Bay-wings, and I concluded that the two females were laying together; for, as I said in a former communication on the subject, more than one female will sometimes lay in the same nest. After taking the ten eggs the Bay-wings still remained; and I observed them a great deal, but could never see more than one pair about the nest. The next time I climbed to the nest it contained five eggs; these I also took, and thought that the bird that laid the additional five eggs before had gone away on finding herself robbed. The birds still remained; and when I had reason to believe that they had commenced to lay the fourth time, I visited the nest and found two eggs in it; I left them, and returned in three days expecting to find five eggs, but found seven! Certainly more than one female had on this occasion laid in the nest. I have invented several theories to account for the additional eggs; but they are not satisfactory, and it is useless to record conjectures. After taking the last eggs, the Bay-wings left; and though the *Molothri rufoaxillares* continued to make rather frequent visits to the nest, to my great disappointment they did not lay in it. Last summer (1871–2) I found one nest of the Bay-wings; it was deep and nicely made of long dry grass and fibrous roots. All the other pairs I observed bred in nests of other birds, most of them in Leñateros' nests. This summer (1872–73) all the pairs of Bay-wings I have observed have laid in the nests taken from other birds.

VI. *Habits of* Molothrus rufoaxillaris.—This species is by no means rare, though not so abundant as the others; probably its close resemblance to the *M. bonariensis* kept it so long unknown to ornithologists. Like the *M. badius*, it remains with us the whole year. The *M. rufoaxillaris* is never seen alone; nor are they strictly gregarious, but in winter go in parties never exceeding five or six in number. One of its most noteworthy traits is an exaggerated hurry and bustle it throws into all its movements. When passing from one branch to another it goes by a series of violent jerks, smiting its wings loudly together; and when a party of them return from the fields they rush wildly and screaming to the trees, as if pursued by a Falcon. Their language is as abrupt as are their motions. They are not singing birds; but the male sometimes, though rarely, attempts a song, and utters, with considerable effort, a few brief and unmelodious notes. The chirp with which he invites his mate to fly has the sound of a loud and smartly given kiss. His warning or alarm note when approached in the breeding-season has a soft and pleasing sound; it is his only mellow expression. This most common as well as remarkable vocal performance is a cry beginning with a hollow-sounding internal note, and swelling into a sharp metallic ring; it is uttered with tail and wings spread and depressed, the whole plumage raised like that of a strutting turkey-cock, whilst the bird hops briskly up and down on its perch as if dancing. From its manner of puffing itself out, and from the peculiar nature of the sound it produces, I believe that, like the Pigeon and other species, it has the faculty of filling its crop with air, using it as a "chamber of resonance." The note I have described is quickly and invariably followed by a scream, harsh and impetuous, uttered by the female, though both notes always sound as if proceeding from one bird. Frequently, when the flock is on the wing, these screaming notes without the prelude are uttered by all the birds in concert. The plumage of this species has a strong musky smell; the œsophagus is remarkably wide. It lives almost exclusively on seed; but sometimes a large caterpillar or spider is also found in the stomach.

VII. *The* M. rufoaxillaris *is parasitical on the* M. badius.—April 12, 1873.—To-day I have made a discovery, and am as pleased with it as if I had found a new planet in the sky. The mystery of the Bay-wings' nest twice found containing over the usual complement of eggs is cleared up, and I have now suddenly become acquainted with the procreant instinct of *M. rufoaxillaris*. I esteem it a great piece of good fortune; for I had thought that the season for making any such discovery was already over, so near are we now to winter. The Bay-wings are so social in their habits, that they appear reluctantly to break up their companies in the breeding-season; no sooner is this over, and when the young birds are still fed by their parents, than all the families about a plantation unite into one flock. About a month ago all the birds about my trees had associated in this way together, and wandered about in a scattered party, frequenting one favourite spot very much, about fifteen minutes' walk from the house. The flock was composed, I think, of three families, about fifteen or sixteen birds in all: the young birds are indistinguishable from the adults; but I know that most of these birds were young hatched late in the season, from their incessant strident hunger-notes. From the time of my first seeing them together before the middle of March, I never observed the flock closely till to-day. A week ago I rode past the flock and noticed among them three birds with purple spots on their plumage. They were at a distance from me; and I of course concluded that they were young of *M. bonariensis* casually associating with the Bay-wings. It surprised me very much at the time; for the young male *M. bonariensis* always acquires the purple plumage before March. To-day while out with my gun I came upon the flock and observed four of the birds assuming the deep-purple plumage, two of them being almost entirely that colour; but I also noticed with astonishment that they had bay wings like the birds they followed, also that those that had least purple on them were marvellously like the Bay-wings in the mouse-coloured plumage and blackish-brown tail. I had seen these very birds a few weeks ago and before the purple plumage was acquired, and there was not the slightest difference amongst them; now they appeared to be undergoing the process of a transmutation into another species! I immediately shot four of them along with two genuine Bay-wings, and was delighted to find the purple-spotted birds to be the young of *M. rufoaxillaris*.

I must now believe that the extra eggs twice found in the nest of the Bay-wings were those of *M. rufoaxillaris*, that the latter species has a particular predilection for laying in the nests of the former, that the eggs of the two species are identical in form, size, and coloration, and that, stranger still, the mimicry is as perfect in the young birds as in the eggs.

The *M. rufoaxillaris* is the fourth *Molothrus* with the procreant habits of which we are now acquainted; for besides the three Buenos-Ayrean and the single North-American species, I know not that the habits of any others have been ascertained. There is a network of affinities in the nesting-habits, colour of plumage and the changes it undergoes, and in the peculiar language and gestures of these four species that is complex enough; but the complexity will probably be much increased when we become familiar with the instincts of the other members of the genus. We may wait to hear something out of the common in their nesting-habits, as confidently as we expect to find pale green eggs in the nest of a *Coccyzus* or feathers in the stomach of a Grebe.

April 15, 1873.—This morning I started in quest of the Bay-wings. As soon as I got near them (for they were in the usual place) I observed one bird, that had somehow escaped detection the day before, assuming the purple plumage. This bird I shot; and after the flock had resettled a short distance off, I crept close up to them under the shelter of a hedge to observe them more narrowly. One of the adults was closely attended by three young birds; and they all, whilst I observed them, fluttered their wings and clamoured for food each time the parent bird stirred on her perch. One of the three young birds was spotted with purple; and this bird I brought down, together with its foster-parent and one of its foster-brothers. These last two specimens (for I could see no more) were more interesting than the others I had obtained, as they had fewer purple feathers; and it may be seen in them how closely at first these birds resemble their foster-brothers the young of *M. badius*. The hunger-cry of the young *M. badius* is quite different from that of the young *M. bonariensis*. The cry of the latter is a shrill two-syllabled note, the last syllable being lengthened out into a continuous squeal when the foster-parent approaches to feed it. The hunger-cry of the young *M. badius* is short, somewhat strident, tremulous, and uninflected. The resemblance of the young *M. rufoaxillaris* to its foster-brothers in language and plumage is the more remarkable when we reflect that the adult *M. rufoaxillaris* in all its habits, gestures, and notes, as well as in its purple plumage, comes vastly nearer to *M. bonariensis* than to *M. badius*. It seems impossible for mimicry to go further than this. A slight difference in size is quite imperceptible when the birds are flying about; but in language and plumage the keenest ornithologist would not detect a difference. But it may be questioned whether this is in reality a case of an external resemblance of one species to another acquired by natural selection for its better preservation. Is it not as reasonable to believe that the young of *M. rufoaxillaris* in the first stage of its plumage exhibits the ancestral type (that of the progenitor of both species), that it has not supplanted the unvarying and consequently unimproved descendants (*M. badius*), simply because its elective parasitical instinct has made its existence dependent on that species? Did the *M. badius* belong to some other group, *Sturnella* or *Pseudoleistes* for instance, it would not then be possible to doubt that the resemblance of the young *M. rufoaxillaris* to its foster-brothers resulted from mimicry; but as the two species belong to the limited group *Molothrus* the resemblance might be ascribed to community of descent.

VIII. *Probably* Molothrus badius *always hatches its own eggs.*

—Formerly I believed that though the *M. badius* is constantly observed to nidificate, they also occasionally dropped their eggs in the nests of other birds (see P. Z. S. 1870, p. 671). I could not doubt that this was the case after having seen a couple of their young following a Yellowbreast and being fed by it. But later and more careful observations, together with the discovery I have just recorded, have made me alter my opinion. What then appeared to be proof positive is now no proof at all; the young birds I observed were perhaps those of *M. rufoaxillaris.* Indeed it is much more probable that they should have belonged to this than to the other species, since the Bay-wings are constantly seen to rear their own young, whereas I have never found a nest of *M. rufoaxillaris,* and believe they are altogether parasitical.

IX. *Reasons for believing that the* M. rufoaxillaris *is parasitical almost exclusively on* M. badius.—I have spoken of the many varieties of eggs *M. bonariensis* lays. Those of the *M. badius* are a trifle less in size, in form elliptical, very thickly and uniformly marked with small spots and blotches of dark reddish colour varying to dusky brown; the ground-colour is white, but sometimes, though rarely, a very pale blue. It is not possible to confound the eggs of the two species *M. bonariensis* and *M. badius.* Now, ever since I saw, many years ago, the Yellowbreast already mentioned tending the young Bay-wings, I have looked out for the eggs of the latter species in other birds' nests. I have found many hundreds of nests containing eggs of *M. bonariensis,* but never one with an egg of *M. badius,* and, I may now add, never with an egg of *M. rufoaxillaris.* It is wonderful that *M. rufoaxillaris* should lay only in the nests of *M. badius*; but the most mysterious thing is that *M. bonariensis,* which apparently lays in as many nests as ever it can find, never, to my knowledge, drops an egg in the nest of *M. badius*! It will be hard for naturalists to believe this; for if the *M. badius* is so excessively vigilant and jealous of all other birds approaching its nest as to succeed in keeping out the subtle, silent, grey-plumaged, ever-present *M. bonariensis,* why does it not also keep off the rarer, noisy, bustling, rich-plumaged *M. rufoaxillaris*? But this bird may enter the nest forcibly. The *M. badius* may also possess sagacity sufficient to distinguish the eggs of *M. bonariensis* from its own and cast them out of the nest. This point must remain unsettled.

X. *Comparative perfection of the parasitical instinct of* Molothrus rufoaxillaris.—It is with a considerable degree of repugnance that we regard the parasitical instinct in birds: the reason it excites such a sensation is manifestly because it presents itself to the mind, in the words of a naturalist who lived a hundred years ago and believed the Cuckoo had been created with such a habit, as "a monstrous outrage on the maternal affection, one of the first great dictates of nature"—an *outrage,* since each creature has been endowed with the all-powerful affection for the preservation of its own, and not another, species; and here we see it by a subtile process, an unconscious iniquity, turned from its original purpose, perverted, and made subservient to the very opposing agency against which it was intended as a safeguard! The formation of such an instinct seems indeed like an unforseen contingency in the system of nature, a malady strengthened, if not induced, by the very laws established for the preservation of health, and which the *vis medicatrix* of nature is incapable of eliminating. Again, the egg of a parasitical species is generally so much larger, differing also in coloration from the eggs it is placed with, whilst there is such an unvarying dissimilarity between the young bird and its living or murdered foster-brothers, that, unreasoning as we know instinct, and especially the maternal instinct, is, we are shocked at so glaring and flagrant an instance of its blind stupidity. In the competition for place, the struggle for existence, said with reason to be most deadly between such species as are most nearly allied, the operations are imperceptible, the changes so gradual, that the diminution and final disappearance of one species is never attributed to a corresponding increase in another more favoured species over the same region. It is not as if the regnant species had invaded and seized on the province of another, but appears rather as if they had quietly entered on the possession of an inheritance that was theirs by right.

Mighty as are the results worked out by such a process, it is only by a somewhat strained metaphor that it can be called a *struggle*. But even when the war is open and declared, as between a raptorial species and its victims, the former is manifestly driven by necessity. And in this case the species preyed on are endowed with peculiar sagacity to escape its persecutions; so that the war is not one of extermination, but, as in a border war, the invader is satisfied with carrying off the weak and unwary stragglers. Thus the open, declared enmity is in reality beneficial to a species; for it is sure to cut off all such individuals as might cause its degeneration. But we can conceive no necessity for such a fatal instinct as that of the Cuckoo and Molothrus, destructive to such myriads of lives in their beginning. And inasmuch as their preservation is inimical to the species on which they are parasitical, there must also here be a struggle. But what kind of struggle? Not as in other species, where one perishes in the combat that gives greater strength to the victor, but an anomalous struggle in which one of the combatants has made his adversary turn his weapons against himself, and so seems to have an infinite advantage. It is impossible for him to suffer defeat; and yet, to follow out the metaphor, he has so wormed about and interlaced himself with his opponent that as soon as he succeeds in overcoming him he also must inevitably perish. Such a result is perhaps impossible, as there are so many causes operating to check the undue increase of any one species; consequently the struggle, unequal as it appears, must continue for ever. Thus, however we view the parasitical habit, it appears cruel, treacherous, and vicious in the highest degree. But should we attempt to mentally create a perfect parasitical instinct (that is, one that would be thoroughly efficient with the least possible prejudice for or injustice towards another species; for the preservation of the species on which the parasite is dependant is necessary to its own), by combining in imagination all known parasitical habits, eliminating every offensive quality or circumstance, and attributing such others in their place as we should think fit, our conception would probably fall far short in simplicity, beauty, and completeness to the real instinct of the *M. rufoaxillaris*. Instead of laying its eggs promiscously in every receptacle that offers, it selects the nest of a single species; so that its selective instinct is related to the adaptive resemblance in its eggs and young to those of the species on which it is parasitical. Such an adaptive resemblance could not exist if it laid its eggs in the nests of other species, and it is certainly a circumstance eminently favourable to preservation. Then, there not being any such incongruity and unfitness as we find in nests into which other parasitical species intrude, there is no reason here to regard the foster-parent's affection as blind and stupid; the similarity is close enough to baffle the keenest sagacity. Nor can the instinct here appear in the light of an outrage on the maternal affection; for the young *M. rufoaxillaris* apparently possesses no superiority over his foster-brothers. He is not endowed with greater strength and voracity to monopolize the attentions of the foster-parents and to eject or otherwise destroy the real offspring; but being in every particular precisely like them, he has only an equal chance of being preserved. What the most philosophical of naturalists has remarked concerning the architecture of the hive-bee may be applied to this parasitical instinct:—" Beyond this stage of perfection natural selection could not lead;" for it seems absolutely perfect.

XI. *Occasional aberrant procreant habits.*—When considering the parasitical procreant habits of birds, every irregularity in the breeding-habits of other species becomes interesting. I therefore introduce a note on the occasional habit of wasting eggs of some species, and of more than one female laying in the same nest. The *Molothrus bonariensis* wastes many eggs; so also do our two species of *Rhea*; but in the former the parasitical habit is the immediate cause of the occasional habit. Birds that build and observe seasons in laying do not finish their nests precisely at the time when they are ready to drop their eggs, but some little time, often two or three or more days, beforehand; if the nest is destroyed, the growth of the ova is arrested till a new nest is completed. Every summer we see here pairs of parasitical Martins (*Progne tapera*) breeding in November; these birds have succeeded, immediately after arriving, in possessing themselves of ovens of the *Furnarii*, in which alone they breed; but in all the birds that have failed in their attacks on the Oven-birds and do not breed till December and January, the ova, though large, are in abeyance, and only become fully developed when the birds have seized on the ovens about which they have been long fluttering.

This beautiful provision is not necessary in the *Molothrus*; indeed it is obvious that it would prove fatal to the species in a few generations did they possess it. Only when the egg is already in the oviduct and the time for its exclusion approaches, the bird begins to look about for a receptacle; its failing to find one, or its being repulsed from it when found, is a contingency for which no provision has been made; consequently the egg is wasted. In the Rheas all the females in a flock lay in one nest, a male incubating the eggs afterwards. But as each bird lays a large number of eggs, and as they do not begin laying at the same time, long before they have all done laying the male becomes broody and drives them away. This is probably the cause of their wasting so many eggs; for all the females that are ready to lay when the male begins to incubate are compelled to drop them upon the plain. But how can we account for the habit of occasionally wasting eggs in another species—the Urraca (*Cyanocorax pileatus*) for example; for this bird builds an elaborate nest in which but one female lays? In a paper on the habits of this species (P. Z. S. 1870, p. 749) I said that they sometimes built such frail nests that all the eggs dropped through them; but I did not then know that they also wasted a surprising number of eggs. A flock of about sixteen of these birds passed the winter of 1872 in the trees about my house; on the approach of warm weather they began to scatter, incessantly screaming and chattering as their manner is when about to pair and breed. I observed these birds very attentively, but could not detect them building. At last I found three broken eggs on the ground, and on examining the tree overhead discovered an incipient nest, merely a dozen or so of little sticks laid crossways, upon, or rather through, which the eggs had been dropped. This was in October; and till January no other attempt at a nest was made; but eggs in abundance were wasted, for during four months I constantly found them about the orchard. Early in January another nest was made, but with less materials than a Cuckoo would have employed; five or six smashed eggs were on the ground beneath it. Towards the end of January two large nests were built, deep and well-lined with green leaves; in these nests fourteen or fifteen birds were hatched. In this case we see one essential link in the chain of procreant instincts struck out and the whole made abortive; but the cause of the loss or suspension for a time of the architectural habit seems very mysterious.

Besides the Rhea, I know of no species in which two or several females unite habitually to lay in one nest; but there are many species in which two or more females occasionally lay together. This is often the case with *Dendrocygna fulva*, *Vanellus cayennensis*, and *Nothura maculosa*. I can give but one case of two birds of different species laying together: this was the Teal (*Querquedula flavirostris*) and the common Partridge or Tinamou (*Nothura maculosa*). The nest was in a thistle-bush at a distance from the water, and contained the full complement of eggs of both birds.

XII. *Conjectures as to the origin of the parasitic instinct in* M. bonariensis.—The assertion that the "immediate and final cause of the Cuckoo's instinct is that she lays her eggs not daily, but at intervals of two or three days" ('Origin of Species'), carries no great appearance of probability with it; for might it not just as reasonably be said that the parasitic instinct is the immediate and final cause of her laying her eggs at long intervals? If it is favourable to a species with the instinct of the Cuckoo (and it probably is favourable) to lay eggs at longer intervals than other species, then natural selection would avail itself of every modification in the reproductive organs that tended to produce such a result, and make the improved structure permanent. It is said ('Origin of Species,' chapter on instinct) that the American Cuckoo lays also at long intervals, and has eggs and young at the same time in its nest, a circumstance manifestly disadvantageous. Of the *Coccyzus melanocoryphus*, the only one of our three Cuckoos whose nesting-habits I am acquainted with, I can say that it never begins to incubate till the full complement of eggs are laid—that its young are hatched simultaneously. But if it is sought to trace the origin of the European Cuckoo's instinct in the nesting-habits of American *Coccyzi*, it might be attributed not to the aberrant habit of perhaps a single species, but to another and more disadvantageous habit common to the entire genus, viz. their habit of building exceedingly frail platform nests from which the eggs and young very frequently fall. By occasionally dropping an egg in the deep secure nest of some other bird, an advantage would be possessed by the birds hatched in them, and in them the habit would perhaps become hereditary. Be this as it may (and the one guess is perhaps as wide of the truth as the other), there are many genera intermediate between *Cuculus* and *Molothrus* in which no trace of a parasitic habit appears; and it seems more than probable that the analogous instinct originated in different ways in the two genera. As regards the origin of the instinct in *Molothrus*, it will perhaps seem premature to found speculations on the few facts here recorded, and before we are acquainted with the habits of other members of the genus. That a species should totally lose so universal an instinct as the maternal one and yet avail itself of that affection in other species to propagate itself, seems a great mystery. Nevertheless I cannot refrain from all conjecture on the subject, and will go so far as to suggest what may have been at least one of the many concurrent causes that have produced the parasitic instinct. The apparently transitional nèsting-habits of several species, and one remarkable habit of *M. bonariensis*, seem to me to throw some light on a point bearing intimately on the subject, viz. the loss of the nest-making instinct in this species. The hypothesis will perhaps be considered very fine-spun indeed; nevertheless, when a larger body of facts have been got together, it may be of some use to future inquirers; the facts here adduced will also have their value.

Instincts vary greatly. It would be almost a truism to say that were it not so they would not be so well adapted to external conditions as we find them, unless the conditions themselves were unvarying, which is not the case; for whilst a species is well adapted to its station in its instincts or inherited habits, it is frequently not so well adapted to them in its relatively inimitable structure. Thus we have in Buenos Ayres a *Tringa* that avoids the wet, and has all the habits of a strictly upland Plover, a Sparrow (*Ammodromus manimbé*) with the manners of a reed-loving *Synallaxis*, likewise a Tyrant (*Pitangus bellicosus*) that in winter subsists chiefly on mice when they are abundant. It hovers over the grass, and pounces hawk-like on its prey; but this does not suffice, the mouse being too large to be swallowed entire and the bird's bill too straight and weak to tear it in pieces. To remedy this defect or want of structural adaptation to its requirements, it has acquired a supplementary habit, and, carrying its prey to a tree and dexterously swinging it by its hind feet or tail, beats it with violence against a branch until it is bruised into a soft pulp. But however much the instincts of a species may have become altered—the habits of a species being widely different from those of its congeners, also a want of correspondence between structure and habits (the last being always more suited to conditions than the first) being taken as evidence of such alteration—traces of ancient and disused habits frequently reappear. Seemingly capricious actions too numerous, too vague, or too insignificant to be recorded, improvised definite actions that are not habitual, apparent imitations of the actions of other species, a perpetual inclination to attempt something that is never attempted, and attempts to do that which is never done—these and other like motions are, I believe, in many cases to be attributed to the faint promptings of obsolete instincts. To the same cause many of the occasional aberrant habits of individuals may possibly be due—such as of a bird that builds in trees occasionally laying on the ground. If recurrence to an ancestral type be traceable in structure, coloration, language, it is reasonable to expect something analogous in instincts. But even if such casual and often harmless motions as I have mentioned should guide us unerringly to the knowledge of the old and disused instincts of a species, this knowledge of itself would not enable us to discover the origin of present ones. But assuming it as a fact that the conditions of existence, and the changes going on in them, are in every case the fundamental cause of alterations in habits, I believe that in many cases a knowledge of the disused instincts will assist us very materially in the inquiry. I will illustrate my meaning with a supposititious case. Should all or many species of *Columba* manifest an inclination for haunting rocks and banks and for entering or peering into holes in them, such vague and purposeless actions, connected with the facts that all Doves build simple platform nests (like *Columba livia* and birds that build on a flat surface), also lay white eggs (the rule being that eggs laid in dark holes are white, exposed eggs coloured), also that one species, *C. livia*, does lay in holes in rocks, it would be easy to believe that the habit of this species was once common to the genus. We should conclude that an insufficiency of proper breeding-places, *i. e.* new external conditions, first induced Doves to build in trees. The *C. livia* also builds in trees where there are no rocks; but when able, returns to the ancestral habits. In the other species we should believe the primitive habit to be totally lost from disuse, or only to manifest itself in a faint uncertain manner. Still it will be asked, what, in faint and uncertain habits of species or in the occasional actions of individuals, is the criterion to distinguish those due to the laws of variation from those due merely to recurrence? I presume that the two kinds of divergence, essentially different in origin, may be distinguished in much the same way as in divergences from type in structure, colour, &c. A horse clothed with hair 6 inches long would afford an instance of divergence arising from the laws of variation; for not one circumstance in the history of the genus could incline one to believe it an instance of reversion of type *. But the stripes on the dun horses and on mules are attributed to recurrence to an ancestral type, *because* other species of *Equus* are striped. In the following instances we have, I think, examples of these two kinds of divergence.

All the wild Pigeons of La Plata (four in number), when feeding, walk upon the ground in a somewhat leisurely manner. The *Zenaida maculata* of Patagonia, which in its other habits so closely resembles the La-Platan *Zenaida* when feeding hurries about, snatching up its food with such marvellous rapidity that the most animated motions of other birds that feed on the ground in flocks seem languid in comparison. This lively habit of the Patagonian Pigeon, in which it differs so much from its congeners, is, I believe, due to the conditions of life. The barren soil and scanty vegetation of the region it inhabits requires in an exclusively seed-eating species that goes in large bodies a far greater activity than is necessary in the rich fertile regions further north. When pursued by a bird of prey or by a man on horseback, the *Nothura maculosa* escapes into the burrows of the Vizcacha or Armadillo. To take refuge in burrows is not, I believe, a habit of any other gallinaceous species, but in every thing (structure, colour, and habits) they all appear to be beautifully adapted to elude their enemies on the exposed surface of the earth; so that the habit of the Buenos-Ayrean Partridge seems very incongruous. Such a habit can only be due to the special conditions in which the bird is placed—that is, to the shelterless plains with numerous burrows in which alone it can find security from persecution. One of the common Pampas butterflies, the *Pyrameis carye*, has a remarkable habit: when not feeding, it alights on the bare ground rather than on plants; and immediately on alighting it opens its wings and turns itself rapidly about till placed in such a position that the sun shines directly on the sloping surface of the wings and body. On cold days, when other species of Lepidoptera sit with closed wings amidst the leaves and appear weak and languid, the *P. carye* basks with open wings upon the barren ground, and is then just as shy and lively as when the weather is warm. This sun-loving habit is identical in one of our birds, the *Cyanocorax pileatus*, described in a former paper. Every year many individuals of *P. carye* survive the winter; and their extreme hardiness is perhaps attributable to the heat-catching habit. Two other Lepidopteres also possess the habit; but it is far less perfect in them, and they never live through the winter. This habit of our *Pyrameis* and *Cyanocorax* I am also inclined to attribute to variation induced by the conditions of life.

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* The hide of a long-haired variety of the horse was brought by the Tehuelcho Indians to the settlement on the Rio Negro of Patagonia a few years ago.

The Patagonian Thrush (*Turdus falklandicus*) is not a singing bird; occasionally, however, in spring, an individual is heard to sing. I believe the singing in this case is a recurrence to a disused habit, because most Thrushes sing, also because the La-Platan Thrushes never sing in winter or during high winds in summer (high winds prevail all summer in Patagonia, though the winter is calm), also because the song of *T. falklandicus*, when it does sing, is like a laboured imitation of the song of *T. rufiventris* of La Plata, the species which it most closely resembles.

The following also appears to be an example of recurrence to an ancestral instinct. A physiological study of the Ophidians has, I believe, afforded some reasons for supposing that these reptiles or their progenitors were all originally aquatic in their habits. The extreme readiness with which land-snakes enter the water, their apparent fondness for it, as if it were their native element, and the facility with which they swim give greater strength to the supposition. Last summer (December 1872) I noticed a *Coronella anomala* on the border of a stream where I was fishing, with its body so much distended that, curious to learn what it had swallowed, I killed and opened it. There were in it fifteen little fishes, varying in size from 2 to 3½ inches in length. A few of the fishes had begun to decompose; but they had evidently all been taken that day, showing in what marvellous perfection this individual possessed the fishing instinct. Yet the *C. anomala* (our commonest snake, though until lately undescribed) abounds everywhere on dry elevated plains where there is never any standing water. This snake was a full-grown male 14½ inches long; the female differs in colour, and is much larger. From the number of leaves that had been swallowed along with the fishes it was evident that the snake had lain among the rotting leaves of the floating water-lilies to watch for its prey; and indeed the colour of the body, the stem-like raised neck, and still watchful habit seem to adapt it for preying on fish in the water rather than on mice, birds, &c. on dry land.

The last case of recurrence, or what appears such, will probably seem less obvious than the preceding ones; it refers to *Molothrus bonariensis*, and a strange purposeless habit of that species already mentioned in a former paper. Before and during the breeding-season the females, sometimes accompanied by the males, are seen continually haunting and examining the domed nests of some of the Dendrocolaptidæ. This does not seem like a mere freak of curiosity, but their persistence in the habit is precisely like that of birds that habitually make choice of such breeding-places. It is most surprising that they never do in reality lay in such nests, except when the side or dome has been accidentally broken enough to admit the light into the interior. Whenever I set up boxes in my trees, the first bird to visit them is the female *M. bonariensis*. Sometimes one will spend half a day loitering about and inspecting a box, repeatedly climbing round and over it, and always ending at the entrance, into which she peers curiously and, when about to enter, starting back as if scared at the obscurity within. But after retiring a little space, she will return again and again, as if fascinated with the comfort and security of such an abode. It is amusing to see how pertinaciously they hang about the ovens of the Oven-birds, apparently determined to take possession of them, flying back to them after a hundred repulses, and yet not entering them, even when they have the opportunity. Sometimes one is seen following a Wren or a Swallow to its nest beneath the eaves, and then clinging to the wall beneath the hole into which it disappeared. I could fill many pages with instances of this habit of the *M. bonariensis*, which, useless though it be, is as strong an affection as the bird possesses. That it is a recurrence to a long disused habit, I can scarcely doubt; at least, to no other cause, that I can imagine, can it be attributed; and, besides, it seems to me that if the *M. bonariensis*, when once a nest-builder, had acquired the semiparasitical habit of breeding in domed nests of other birds, such a habit might conduce to the formation of the instinct which it now possesses. In my former letter on the *M. bonariensis* I mentioned that twice I had seen birds of this species attempting to build nests, and that on both occasions they failed to complete the work. So universal is the nest-making instinct that one might safely say the *M. bonariensis* had once possessed it, and that in the cases I have mentioned it was a recurrence, too weak to be efficient, to the ancestral habit. Another interesting circumstance may be adduced as strong presumptive evidence that the *M. bonariensis* once made itself an open exposed nest as *M. badius* occasionally does—viz. the difference in colour of the male and female; for whilst the former is rich purple, the latter has what naturalists consider an adaptive resemblance in colour to the nest and to the shaded interior twigs and branches on which nests are usually built. How could such an instinct have been lost? To say that the *M. bonariensis* occasionally dropped an egg in another bird's nest, and that the young hatched from these accidental eggs possessed some (hypothetical) advantage over those hatched in the usual way, and that so the parasitical habit became hereditary, supplanting the original one, is an assertion without any thing to support it, and seems to exclude the agency of external conditions. Again the want of correspondence in the habits of the young parasite and its foster-parents would in reality be a disadvantage to the former; the unfitness would be as great in the eggs and other circumstances. For all the advantages the parasite actually possesses in the comparative hardness of the egg-shell, rapid evolution of the young, &c., already mentioned, must have been acquired little by little through the slowly accumulating process of natural selection, but subsequently to the formation of the original parasitical inclination and habit. I am inclined to believe that *M. bonariensis* lost the nest-making instinct by acquiring that semiparasitical habit, common to so many South-American birds, of breeding in the large covered nests of the Dendrocolaptidæ. We have evidence that this semiparasitical habit does tend to eradicate the nest-making one. The *Synallaxes* build great elaborate domed nests; yet we have one species (*S. ægithaloides*) that never builds for itself, but breeds in the nests of other birds of the same genus*. In some species the nesting habit is in a transitional state. *Machetornis rixosa* sometimes makes a shallow elaborate nest in the angle formed by twigs and the bough of a tree, but prefers, and almost invariably makes choice of, the the covered nest of some other species or of a hole in the tree. It is precisely the same with our Wren, *Troglodytes fuscus*. The *Sycalis pelzelni* invariably breeds in a dark hole or covered nest. The fact that these three species lay coloured eggs, and the first and last very darkly coloured eggs, inclines one to believe that they once invariably built shallow exposed nests, as the *M. rixosa* still occasionally does. It may be added that these species that lay coloured eggs in dark places construct and line their nests far more neatly than do the species that breed in such places, but lay white eggs. As with the *M. rixosa* and Wren, so it is with the Bay-winged *Molothrus*; it lays mottled eggs, and occasionally builds a neat exposed nest; yet so great is the partiality it has acquired for the domed large nests, that whenever it can possess itself of one by dint of fighting, it will not build one for itself. Let us suppose that the *M. bonariensis* also once acquired the habit of breeding in domed nests, and that through this habit its original nest-making instinct was completely eradicated, it is not difficult to imagine how in its turn this instinct was also lost. A diminution in the number of birds that built domed nests, or an increase in the number of species and individuals that breed in such nests, would involve the *M. bonariensis* in a struggle for nests, in which it would probably be defeated. In Buenos Ayres the Common Swallow, the Wren, and the *Sycalis chloropsis* prefer the ovens of the *Furnarius* to any other breeding-place, but to obtain them are obliged to struggle with the *Progne tapera*; for this species has acquired the habit of breeding exclusively in the ovens. They cannot, however, compete with the Martin; and the increase of one species has thus deprived three other species of their favourite building-place. Again, the *Machetornis rixosa* prefers the great nest of the *Anumbius*; and when other species compete with it for the nest, they are invariably defeated. I have seen a pair of *Machetornis* after they had seized a nest attacked in their turn by a flock of six or eight Bay-wings; but, in spite of the superior numbers, the fury of the *Machetornis* compelled them to raise the siege. Thus some events in the history of our common *Molothrus* have perhaps been accounted for, if not the most essential one—the loss of the nest-making instinct from the acquisition of the habit of breeding in the covered nests of other birds, a habit that has left a strong trace in the manners of the species, and perhaps in the pure white unmarked eggs of so many individuals; finally we have seen how this habit may also have been lost. But the parasitical habit of the *M. bonariensis* may have originated when the bird was still a nest-builder. The origin of the instinct may have been in the occasional habit, common to so many species, of two or more females laying together; the progenitors of all the species of *Molothrus* may have been early infected with this habit, and inherited with it a facility for acquiring their present one. *M. pecoris* and *M. bonariensis*, much as their instincts differ in some points, are both parasitic on a great number of species—*M. rufoaxillaris* on *M. badius*; and in this species two or more females frequently lay together. Supposing such a habit as of two or more females very frequently laying together in the *M. bonariensis* when it was a nest-builder, or incubated its own eggs in the nests it seized, the young of those birds that oftenest abandoned their eggs to the care of another would probably inherit a weakened maternal instinct. The continual intercrossing of the birds with weaker and stronger instincts would prevent the formation of two races differing in habit; but the whole race would become deteriorated and decline, and would only be saved from final extinction by some individuals laying occasionally in the nests of other species, perhaps of a *Molothrus*, as *M. rufoaxillaris* still does in the nest of *M. badius*, rather than of birds of other genera. Certainly in this way the parasitic instinct may have originated in the *M. bonariensis* without that species ever having acquired the habit of laying and incubating in the covered dark nests of other birds. I have supposed that they once possessed it merely to account for their strange partiality for such nests, appearing, as it does to me, so much like recurrence to an ancestral habit.

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* The nest in which Darwin (Voy. of Beag. iii. p. 79) found this *Synallaxis* breeding, and which he naturally supposed to have been built by the bird, was probably a nest of *S. modesta*.

2. On a small Collection of Birds from Barbadoes, West Indies. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received February 5, 1874.]

I have the honour of exhibiting a small collection of birds from Barbadoes, West Indies, which has been transmitted to me in spirit by Sir Graham Briggs, F.Z.S. The only authority on the birds of this island at present is the unsatisfactory nominal list given by Sir Robert Schomburgk in his 'History of Barbadoes' (London, 1847), p. 680*.

The collection forwarded by Sir Graham Briggs contains specimens of the following species.

1. Dendrœca petechia (Linn.).

A well-known Antillean species.

2. Certhiola martinicana (Gm.).

The *Certhiola* of Barbadoes appears to agree best with that of Martinique and S. Lucia, but shows hardly any of the characteristic white on the middle of the throat, as do my specimens from the last-named island. As, however, my single skin from Barbadoes has been in spirit, I should not venture to distinguish the Barbadian form until further specimens are received for comparison.

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* *Cf.* P. Z. S. 1871, p. 267.

3. **Loxigilla noctis** (Linn.).

Also found in Martinique and S. Lucia.

4. **Phonipara bicolor** (Linn.).

This is the "Parson Sparrow" of Barbadoes. I cannot now distinguish the forms of the various islands, Venezuela, and Columbia, and unite them all (including *P. omissa*, Jard.) under this name. *P. marchii*, Baird, Pr. Ac. Phil. 1863, p. 297, of Jamaica and St. Croix is perhaps distinct.

5. **Quiscalus fortirostris**, Lawr. Pr. Ac. Sc. Phil. 1868, p. 360.

My single specimen is apparently a female of the species recently described by Mr. Lawrence.

I have lately come to the conclusion that the species of this genus from S. Lucia and Martinique, which in my paper on the birds of the former island (P. Z. S. 1871, p. 271) I referred to the continental *Q. lugubris*, must stand as distinct, having a longer and more incurved bill, and a *brown* female, whereas in *Q. lugubris* the sexes are similar in plumage. In order to avoid giving it a fresh name I call it *Q. inflexirostris*, Sw., though the bill certainly does not quite agree with Swainson's figure (An. in Menag. p. 300).

6. **Elainea martinica** (Linn.); Scl. P. Z. S. 1871, p. 271.

7. **Eulampis holosericeus** (Linn.).

8. **Orthorhynchus cristatus** (Linn.).

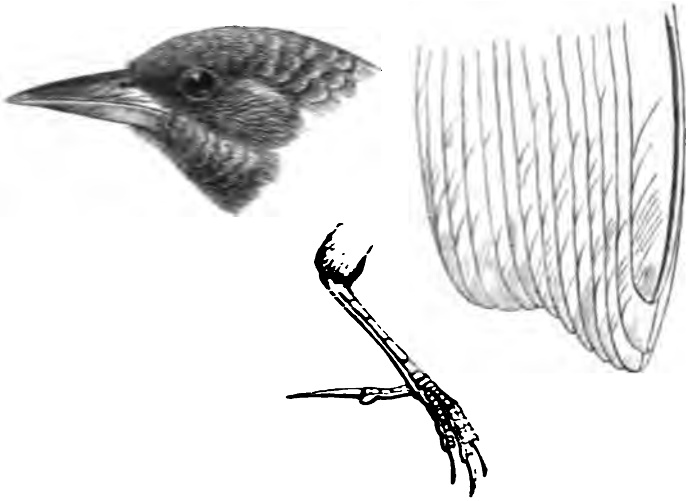
9. **Chamæpelia passerina** (Linn.).

3. On *Centropsar*, an apparently new Form of the Family *Icteridæ*. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received February 23, 1874.]

(Plate XXVI.)

In a large collection of bird-skins which has lately passed through the hands of Mr. Edward Bartlett, and of which he has kindly submitted a selection to my examination, I find a single example of a form that is quite new to me, as also to other ornithologists to whom I have shown it. Judging by the beak and wings, it would appear to belong to the family Icteridæ, or Starlings of the New World; but its feet are slender, and have a straight elongated hind claw, and the rectrices are stiffened, so that it cannot be referred to any known genus of that family. I therefore propose to introduce it to science under the new generic title *Centropsar* (*κέντρον*, *calcar*, et *ψάρ*, *sturnus*), with the following characters.



Head, wing, and foot of *Centropsar mirus.*

CENTROPSAR, genus nov. ex familia Icteridarum.

Rostrum tenuiusculum, elongatum, subulatum, dente nullo, omnino icterinum. Alæ breviusculæ, rotundatæ; remigibus primariis decem, horum tertio quarto et quinto longissimis, primo secundarios æquante. Pedes parvæ, debiles, acrotarsiis obsolete divisis, ungue postico elongato, recto, acuto. Cauda vix rotundata, e rectricibus duodecim rigidis et ad apices attritis composita.

The single known species of this anomalous genus will stand as follows:—

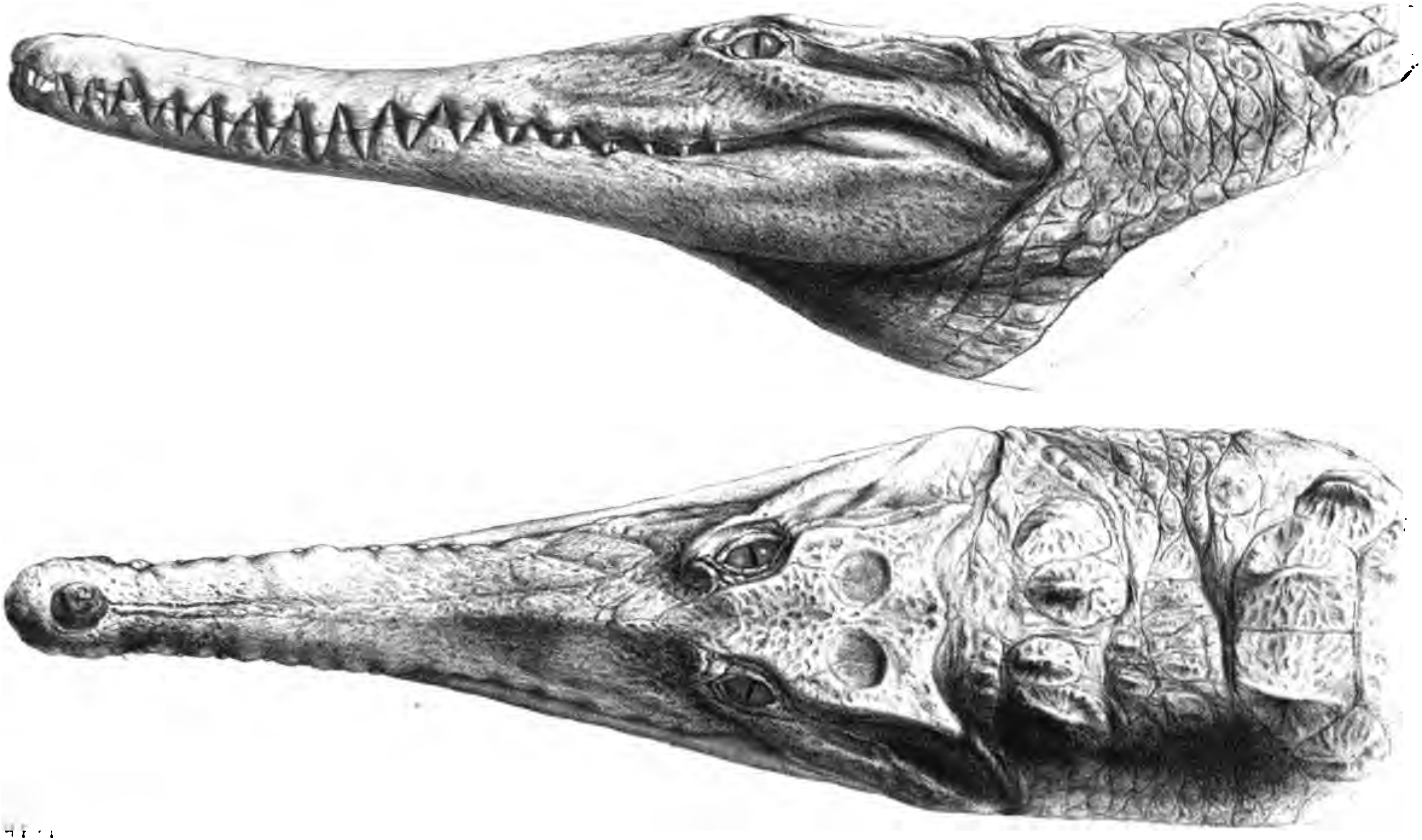
CENTROPSAR MIRUS, sp. nov. (Plate XXVI.)

Supra cinereus, subtus cineraceo-albus: capite toto cum collo medialiter in pectus extenso, caudæ tectricibus superioribus et inferioribus et cauda ipsa nigris: alis fusco-nigris; remigibus fusco anguste, secundariis et tectricibus albido latius limbatis; rostro obscure corneo, mandibula utrinque ad basin plumbea: long. tota 7·5, *alæ* 3·3, *caudæ* 3·1.

Hab. Mexico occidentalis.

Mus. P. L. S.

The collection which contained this singular bird is said to have been formed in Western Mexico and Australia. If, as I believe, *Centropsar* is an Icterine form, the specimen must have been obtained somewhere in the former country. Other scarce Mexican species in the same collection were *Catharus mexicanus, Centurus hypopolius, Trogon mexicanus,* and *Panyptila melanoleuca.*



PHILAS JOHNSTONII

Mintern Bros. imp.

4. On *Crocodilus johnstoni*, Krefft.

By Dr. J. E. Gray, F.R.S. &c.

[Received February 17, 1874.]

(Plate XXVII.)

Mr. Krefft has kindly sent to the Museum a cast in plaster of Paris of the head and dorsal shield of a Crocodile discovered by Mr. Johnston, of Cardwell, Rockingham Bay, Queensland. It is, as I decided P. Z. S. 1873, p. 334, from the examination of a photograph, a Crocodile, but differing from all other Crocodiles in the form of its head and teeth.

This Crocodile has had various names given to it. When Mr. Krefft sent me a photograph of the skull in 1871, I proposed to call it *Tomistoma krefftii*; but that name was never published, and the examination of the skull has shown that this Crocodile is not a *Tomistoma*.

Mr. Krefft, in the Society's 'Proceedings' for 1873, p. 335, describes it under the name of *Crocodilus johnsoni*, and says it was discovered by Mr. Johnson; but in a letter to me of the 15th of May, 1873, he says, "I call it *Crocodilus johnstoni*," not "*johnsoni*;" and I suppose the name should be that of Mr. Johnston of Cardwell, and not Johnson, as mentioned in Mr. Krefft's paper in the 'Proceedings.'

This species agrees with the Crocodiles of the Old World in the possession of four nuchal shields in a cross line at the back of the head, and in having a rhombic cervical disk of six keeled shields, the lateral ones being smaller and opposite the suture between the front and hinder pair. The dorsal disk is formed of six longitudinal series of nearly equal keeled scales, with one or two more or less distinct rows of smaller shields on each side, the inner one of which does not reach the hinder thighs, and the outer one is much shorter and smaller. The keels of the two outer series of dorsal shields unite together, and form one keel just before the front of the thighs, which is extended down the side of the tail, as in the African Crocodiles. The toes are webbed, and the hinder sides of the legs and feet have a fringe of elongated triangular scales.

The African and Australian Crocodiles differ from the *Moliniæ* of Central America in the head being only slightly or not enlarged in front of the lower canines.

The form of the head of the Australian Crocodile is so different from the form of the head of the African and Madagascar species that I am inclined to make them into two sections or subgenera.

1. CROCODILUS.

The head depressed, rather broad, tapering in front; the forehead and upper part of the face flat, shelving on the sides.

1. CROCODILUS VULGARIS, Gray, Cat. Sh. Rept. part ii. p. 15.

Continental Africa, North, West, East, South. B.M.

2. Crocodilus madagascariensis, Gray, P. Z. S. 1874, p. 145, pl. xxiii.

Madagascar. B.M.

2. Philas.

Head elongate, slender, conical. Forehead flat before and between the eyes, with a slight convex narrow ridge in front to the middle of the beak; face rounded on the sides from the central line; nose subcylindrical.

Philas johnstoni. (Plate XXVII.)

Crocodilus johnstoni, Krefft, MS.
Crocodilus johnsoni, Krefft, P. Z. S. 1873, p. 334.
Tomistoma krefftii, Gray, MS., *fide* Krefft.
Australia, Queensland, Cardwell (*Johnston, Bloxland, Krefft*).

The head nearly twice and a half as long as broad; specimen 7 feet long.

5. Note on a Gigantic Cephalopod from Conception Bay, Newfoundland. By W. Saville Kent, F.L.S., F.Z.S., some time Assistant in the Natural-History Department of the British Museum, and late Curator of the Brighton Aquarium.

[Received February 17, 1874.]

The 'American Sportsman' for December 6, 1873, for which I am indebted to the Editor for a separate copy sent me, contains a well authenticated account of a huge Cephalopod lately encountered in Conception Bay, Newfoundland, one of the longer arms of the same having been secured and deposited in the St. John's Museum.

The full description of the monster as contributed by the Rev. M. Harvey of St. John's, may be thus condensed* :—

Two fishermen, while plying their vocation off Great Belle Island, Conception Bay, October 26, 1873, suddenly discovered, at a short distance from them, a dark shapeless mass floating on the surface of the water. Concluding that it was probably part of the cargo of some wrecked vessel, they approached, anticipating a valuable prize, and one of them struck the object with his boat-hook. Upon receiving the shock the dark heap became suddenly animated, and spreading out discovered an intelligent face, with a pair of large prominent ghastly eyes, which seemed to gleam with intense ferocity, the creature at the same time exposing to view, and opening, its parrot-like beak with an apparently hostile and malignant purpose. The men were petrified with terror, and for a moment so fascinated by the horrible sight as to be powerless to stir. Before they had time to recover their presence of mind, the monster, now but a few feet from the boat, suddenly shot out from around its head several long arms of corpse-like fleshiness, grappling with them for the boat and seeking to envelop it in their folds. Only two of these reached the craft, and, owing to their length, went completely over and beyond it. Seizing his hachet with a desperate effort, one of the men succeeded in severing these limbs with a single well-delivered blow; and the creature finding itself worsted, immediately disappeared beneath the waters, leaving in the boat its amputated members as a trophy of the terrible encounter. One of the arms was unfortunately destroyed before its value was known; but the other, when brought to St. John's and examined by the Rev. M. Harvey, was found to measure no less than nineteen feet; and the fisherman who acted as surgeon declares there must have been at least six feet more of this arm left attached to the monster's body. This separated member is described by Mr. Harvey as being livid in colour and pointed at its extremity, where alone it is covered with rows of cartilaginous horny suckers, each about the size of a quarter-dollar. Unfortunately, the fishermen were too much frightened during the short time the adventure lasted to form a reliable opinion of the length of the animal's body; under the influence of terror, they set it down at forty feet, an estimate which, notwithstanding the extraordinary dimensions of the arm secured, must be received as a considerable exaggeration.

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* See also Mr. Harvey's letter to Principal Dawson, reprinted in the 'Annals & Magazine of Natural History' for January 1874.

Mr. Harvey's supposition that this monster probably belonged to the Teuthidæ, or that section of the Dibranchiate Cephalopoda including the Squids and Calamaries, distinguished by the possession of eight sessile arms and two additional tentacula of much greater length, is entirely borne out by the description communicated; and fortunately we are in possession of other substantial evidence which proves beyond doubt the existence of a species of Calamary as formidable in point of size as the one just described. In the vaults of the British Museum, in fact, there has been long since preserved a single arm of a huge cephalopod, measuring from one end to the other no less than nine feet; the circumference at its base is eleven inches; and thence it gradually tapers off, terminating in a fine point. The suckers, which cover the whole of the under surface of this arm, are distributed in two alternating rows, numbering from 145 to 150 suckers to each row, those at the base having a diameter of half an inch, and gradually decreasing in size as they approach the further attenuate extremity. No authenticated record of the circumstances attending the capture of this remarkable specimen, or of the locality whence obtained, appears to have been preserved; but it is believed to have come from the South-American coast.

The fact that the suckers of this colossal arm are all pedunculated or attached through the medium of a slender stalk, instead of being sessile as in the Octopus, has been already mentioned by myself* as indicating that the creature belonged to the ten-armed Teuthidæ, which, when living, must have possessed two additional tentacula, in all probability at least twice the length of the preserved member. That this last-named specimen again is only one of the shorter arms, is made evident by the disposition of the suckers in two rows throughout its length ; and the information now supplied by Mr. Harvey establishes, in a most gratifying manner, the correctness of the conclusions already drawn concerning it. Both these arms, indeed, now under discussion must have appertained to a body of the most closely approximating proportions, and belong probably to one and the same species. The shorter member in the British Museum has evidently been detached close to its base ; but at the same time it is reasonable to infer that prior to its exposure to the contracting influences of the spirit, wherein it is now immersed, it measured some two or three additional feet ; these added, give a length of precisely half the longer tentacle in the St. John's Museum when perfect, which proportionate dimensions were estimated, while yet unproved, in the reference already given.

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* Article on the "Octopus" in the Official Guide-book to the Brighton Aquarium, by W. Saville Kent, then curator, 1st edition, Brighton, 1873, also in 2nd edition since published, with the author's name excised.

Although it does not appear that the body of any Cephalopod possessing arms and tentacles of such huge dimensions as the foregoing has up to the present time been secured for scientific examination and identification, there is yet abundant evidence that such exist. Several well authenticated accounts of these are contained in Gwyn Jeffreys's 'British Conchology,' article Cephalopoda, vol. v. p. 124. One example, stranded on the west coast of Shetland, is reported to have had tentacles measuring 16 feet long, arms of half that length, and a mantle-sac 7 feet long terminated with fins. A sucker of this specimen, the only part preserved, examined by Prof. Allman, was ¾ of an inch in diameter. Among several monsters cast up on the Danish coast, chronicled by Prof. Steenstrup, one is said to have possessed a body measuring 21 feet, and tentacles 18, or a total length of 39 feet. This specimen is referred by its chronicler to a species of *Architeuthis*, his *A. dux*, two allied forms receiving from the same authority the provisional title of *Architeuthis monachus*. Unfortunately, however, no portions of these animals, sufficient for establishing a scientific diagnosis, or for the purposes of positive reidentification, appear to have been preserved. The following reliable account, which has already appeared in many recent natural-history treatises, may be accepted as additional testimony in proof of the existence of true ocean monsters :—On the 30th of November, 1861, about 20 miles to the north-east of Teneriffe, the French dispatch-boat 'Alecton,' Captain Bouyer, encountered a huge Cephalopod floating, apparently exhausted, on the surface of the water. The endeavour was immediately made to effect its capture, shots being fired at and harpoons plunged into it without any result, the latter being unable to take any hold in its soft yielding flesh. In the end a running noose was successfully cast over the creature's tail ; but on endeavouring to haul it on board, the rope cut through the animal's body, completely severing the tail-piece, which was drawn on deck, the remaining portion at the same time slowly sinking away from view in the depths of the ocean. This adventure lasted fully three hours, an interval which sufficed for one of the officers on board, Monsieur Rodolphe, to make a hasty sketch of the scene, a *fac simile* of which is represented in the admirable marine text-book 'Das Meer,' lately published in Berlin by Dr. Schleider. The commander of the ship, Captain Bouyer, and Consul Sabin Berthelot, then with him, additionally testify to the gigantic size of this creature, to the body alone of which they assigned a length of from 15 to 18 feet, the arms, according to the sketch, measuring something less. Satisfied as to the truth of this account, Crosse and Fischer have conferred upon this animal the name of *Loligo bouyeri*. No portion of this last example having been preserved; the same difficulty is attached to the determining of its exact specific identity with any other form encountered before or since, as seems to apply to Prof. Steenstrup's *Architeuthis monachus* and *A. dux*.

The two fragments now preserved in the British and St. John's Museums, in fact, apparently constitute the only substantial material at present available to work upon; and of the two, that obtained for the latter institution is calculated to prove the more important. Especial value attaches itself to the form and mode of distribution of the suckers on the clubbed extremity of the two longer tentacles; and Mr. Harvey will render a great service to science by making a second careful examination and report in this direction on the example that has lately passed through his hands. In his brief account already given, no mention is made of horny *uncini* or claws in association with these suckers, a fact which suffices to indicate that the animal must not be classed with *Onychoteuthis*, *Euoploteuthis**, or other of the armed Calamaries, but rather with *Loligo*, *Sepioteuthis*, and its allies, having only simple suckers. The evidence supplied by the shorter arm preserved in the British Museum points to a similar conclusion.

The evidence already adduced seeming to indicate that this mighty Cephalopod will scarcely be found, upon more intimate acquaintance, to accord sufficiently with *Loligo* proper as to be placed in the same genus, I propose, provisionally, to create for it the new generic title of *Megaloteuthis* (*megalos*, huge; and *teuthis*, a calamary), and to further distinguish the particular species, of which there is now sufficient material for reidentification in the tentacle deposited in the St. John's Museum, as *Megaloteuthis harveyi*, in grateful acknowledgment of the source to which we are indebted for this most interesting and important accession to our previous knowledge of these formidable Mollusca.

ADDENDA.

Since the composition of the foregoing, an interesting article corroborating the Rev. Mr. Harvey's account, and furnishing additional evidence of similar monsters encountered in the vicinity of Newfoundland, has appeared in the pages of 'Appleton's Journal' for January 31, 1874. Among the latter the Rev. M. Gabriel has stated that in the winter of 1870–71 two entire Cuttlefish were stranded on the beach near Lamalien, which measured respectively forty and forty-seven feet; while more recently an example became entangled in a herring-net near Logie Bay, whose body is said to have measured nine feet, the shorter arms six feet, and the two longer tentacula twenty-two feet. Steps are reported to have been taken to preserve this last-named specimen. In connexion with the St.-John's tentacle, a rough woodcut has been published in the 'Annals and Magazine of Natural History' for January last; and in the more minute description given by Mr. Harvey in a letter to Principal Dawson, there reprinted, the form and arrangement of the suckers at its clubbed extremity are described. These consist, in the first place, of a double row of very large suckers, measuring each 1¼ inch in diameter, with twelve suckers to each row, occupying the centre of the club-shaped expansion; supplementing each extremity of this double row is a cluster of smaller suckers, the group at the proximal end containing fifty, and that at the distal one as many as seventy of these. The smaller suckers are further distinguished from the larger ones by their denticulated edges, those of the latter being smooth. The additional characters furnished by this more complete account will be of high importance for further identification, and serve to distinguish this animal from its nearest allies *Loligo* or *Ommatostrephus*, in which the tentacular club is armed with four rows of suckers.

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* In the Museum of the Royal College of Surgeons is an arm of a species of this genus, *E. unguiculata*, found by Banks and Solander during Cook's first voyage, supposed to have been 6 feet long when perfect. The natives of the Polynesian Islands, who dive for shellfish, have a well-founded dread of these formidable animals. (*Owen*.)

We await, however, still fuller details before attaching a positive diagnosis.

March 17, 1874.

Professor Newton, F.R.S., V.P., in the Chair.

The Secretary called the attention of the Meeting to an important addition that had been made to the Society's Menagerie since the last Meeting. On the 7th inst. the Council had purchased of Messrs. Cross and Jamrach, for the sum of £800, a young male Javan Rhinoceros (*Rhinoceros sondaicus*)* imported from Batavia.

This was believed to be the first example of this Rhinoceros that had ever been brought alive to Europe, although Mr. Blyth (J. A. S. B. xxxi. p. 152) had put forward a theory that one of the Indian Rhinoceroses exhibited in England some time since had belonged to this species.

This addition raised the representatives of the genus *Rhinoceros* in the Society's Gardens to four in number, viz. *Rh. unicornis*, *Rh.*

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* The specific term *sondaicus* of Desmarest (Mamm. p. 399, 1820) appears to be the earliest for this species. In 1824 *javanicus* was published by Geoffroy St.-Hilaire and Frederick Cuvier in the Hist. Nat. des Mamm. pl. 309, and was subsequently adopted by Cuvier in his 'Règne Animal,' by Schreber, and by other authors.

sondaicus, *Rh. lasiotis* (belonging to the Asiatic series), and *Rh. bicornis* (belonging to the African).

A drawing of this interesting animal by Mr. Wolf was exhibited (Plate XXVIII.); and the differences which distinguish it from *Rh. unicornis* were pointed out*.

The following letter addressed to the Secretary by the Rev. S. J. Whitmee, C.M.Z.S., and dated Samoa, South Pacific, Dec. 12th, 1873, was read:—

"I am sending to Sydney a *Didunculus strigirostris* and two Curlews (*Numenius*, sp.) to be forwarded to London for the Zoological Society. The Curlews are from Quiros Island, in lat. 11° 2′ S., and long. 171° W. The bird is occasionally seen in Samoa.

"The *Didunculus* is a young bird which I purchased in June last. It was then just from the nest and unfledged. It must have been hatched in May. This proves the breeding-season to be earlier in the year than I previously thought it was. I once procured an unfledged bird in September and I have seen several young ones about September and October; so we may safely regard the breeding-season as extending from May to September.

"We fed the *Didunculus* for more than a month by placing small pieces of bread-fruit, taro, bread, &c. in its mouth, which was always open for the reception of contributions when any one was near it. In a little more than a month it began to peck for itself. It is now almost an omnivorous feeder. The first plumage was a mottled brown, almost black. The teeth in the bill were scarcely perceptible. The bird looked so little like the adult *Didunculus* when I bought it that it was pronounced by some gentlemen on board one of H.M. men-of-war which was in port, and also by some residents here, to be a different bird. This was fortunate for me; for it was taken to the said naval zoologists before it was offered to me, in the hope of getting a higher price from them than I would give.

"The plumage, legs, and beak of the bird are now assuming the colours of the adult state. But I think they will not be fully developed until the bird is a year old; for I previously kept one ten months from the nest, and it was not then perfectly developed. I believe the bird I now have is a male. It is exceedingly savage. When any one approaches its cage it ruffles its feathers, trembles apparently with rage, and tries to bite. If he gets hold of one's finger I know from experience that he gives a severe gripe. The one I previously kept was just as savage. This one is in a cage alone: that was in a large aviary with a number of other birds, and he was lord of the place—would only allow them to feed when he had finished, and drove them about in a very savage manner.

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* The lateral shoulder-fold in *R. sondaicus* is continued upwards over the back of the neck, so as to cut off an independent shield which covers the nape of the neck and is shaped something like a saddle. In *R. unicornis* this nape-shield is continuous with the larger shield which covers the shoulders, the lateral shoulder-fold being lost on the upper part of the scapula. *R. sondaicus* is also much inferior in size to *R. unicornis*, and has a much longer extensile upper lip.

vegetable food for three or four days, was bought, apparently in a hopeless state of starvation, by one of M. Godeffroy's collectors. He offered it some insects, which it eat readily, and on which diet it soon recovered its health. It was fed for a fortnight upon beetles, grubs, &c., and was thriving well; but, unfortunately, it escaped from its cage one day while it was being fed.

"The native name of the *Pareudiastes* is not *Punæ*, as given in the Society's 'Proceedings' for 1871 on the authority of Mr. Kubary, but *Puna'e*, best spelt for those unacquainted with the Samoan dialect, *Punake*. It is found both on Upolu and Savaii, but is apparently more common on the latter island than on the former. I have never heard of it being seen except some distance inland amongst the mountains."

The following extract was read from a letter addressed to the Secretary by Dr. G. Bennett, F.Z.S., dated Sydney, January 16th, 1874:—

"On the 7th inst. I received a letter from the Rev. Mr. Whitmee, dated Samoa, South Pacific, December 15th, 1873, in which he says, 'I take the liberty of sending to your care, to be transmitted to the Zoological Society of London, one living *Didunculus strigirostris* and two Quiros-Island Curlews. The *Didunculus* is a young bird which I had unfledged from the nest, and eats ravenously almost any thing of the vegetable order. The Curlews also have long been accustomed to vegetable food. They may all be fed on rice, biscuits, &c. on board a ship.'

"These birds arrived in excellent health and condition and continue so to the present day. I have them at my home under Mrs. Bennett's care, which I considered would be better than sending them to the Aviary in the Gardens; and fortunately Broughton is in Sydney in the 'Paramatta,' and I shall request him to take charge of them for you.

"The 'Paramatta' will leave for England early in February."

Dr. A. Günther, F.R.S., made some remarks on the introduction of the Ide (*Leuciscus melanotus*, var. *orfus*) into this country.

The following papers were read:—

1. On the Structure of the Skull and of the Heart of *Menobranchus lateralis*. By T. H. Huxley, Sec.R.S.

[Received March 17, 1874.]

(Plates XXIX.-XXXII.)

I. *The Skull.*

In 1835, Mayer, in his 'Analecten für vergleichende Anatomie,' published a brief account of the anatomy of *Menobranchus lateralis*. Under the head of "Osteologie" (p. 82), he remarks:—

"The skull has a singular form, which results from the brevity of the mandible and the direction of the long quadrate bone obliquely

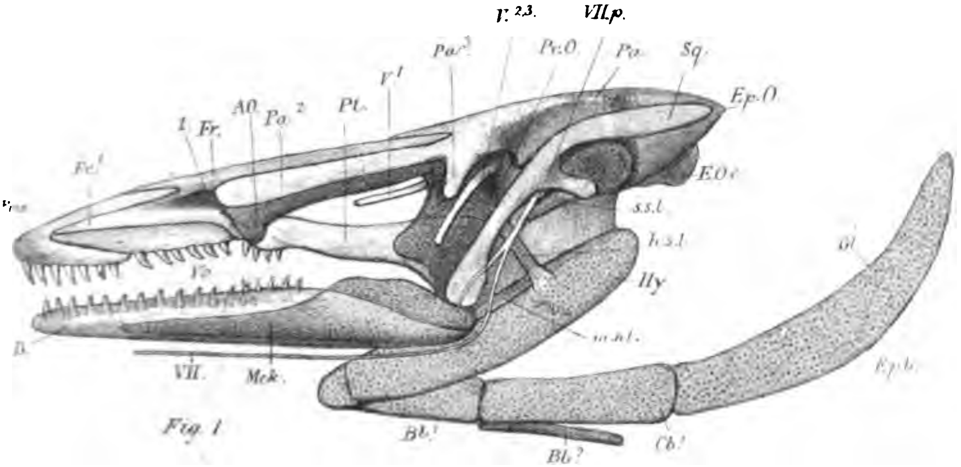


Fig. 1

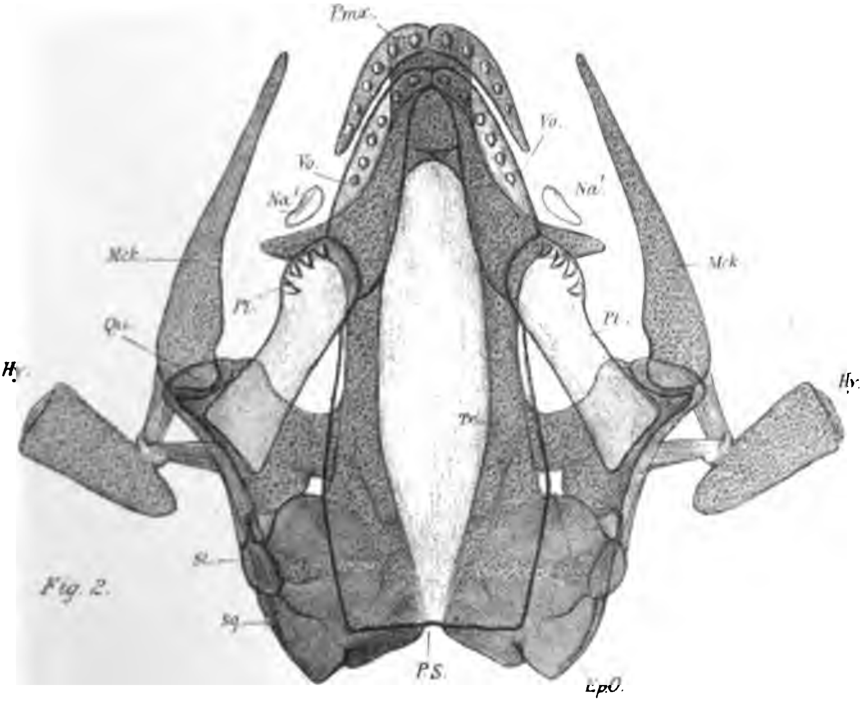


Fig. 2.

G H Wesley lith

M&N Hanhart imp

MENOBRANCHUS

Fig. 1.

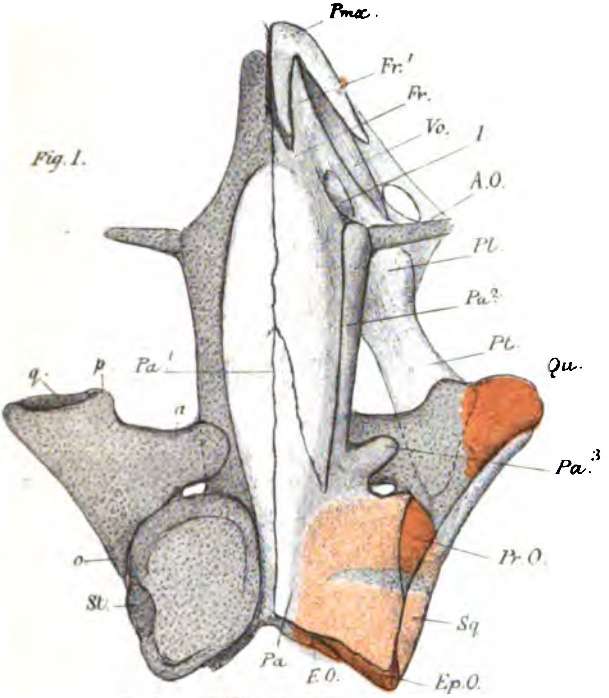
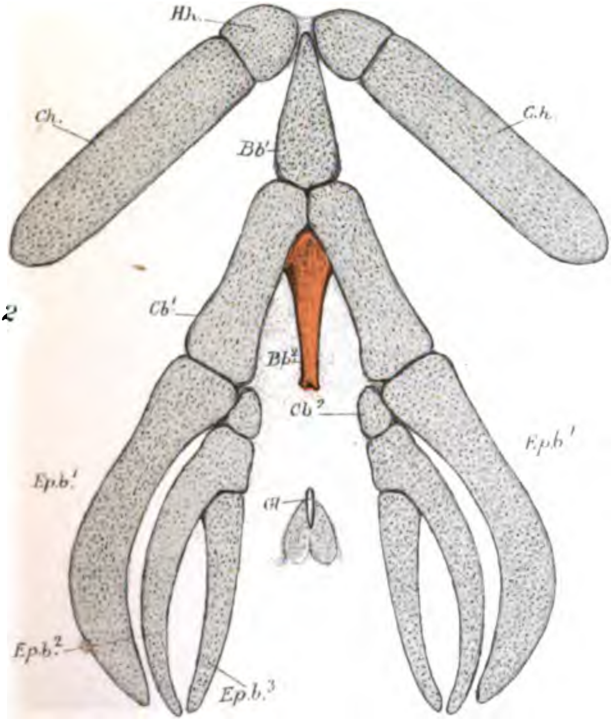


Fig 2.



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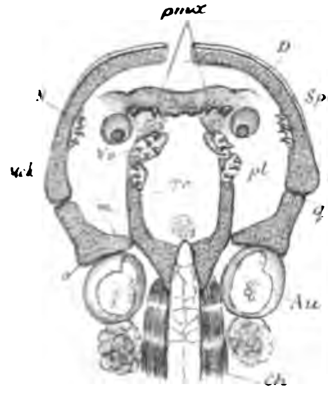

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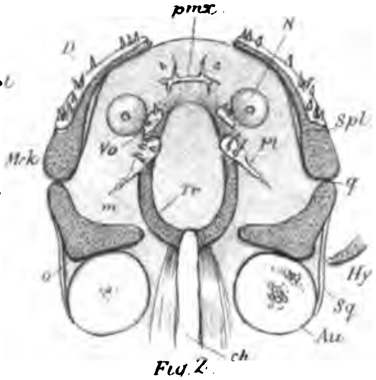

Fig. 2.

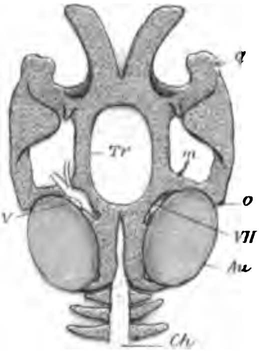

Fig. 3.

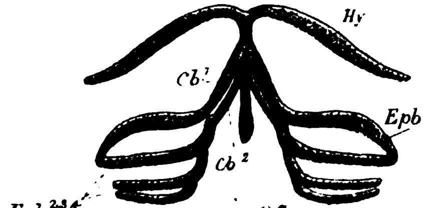

Fig. 2a

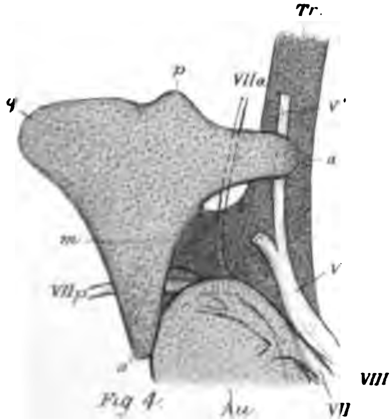

Fig. 4.

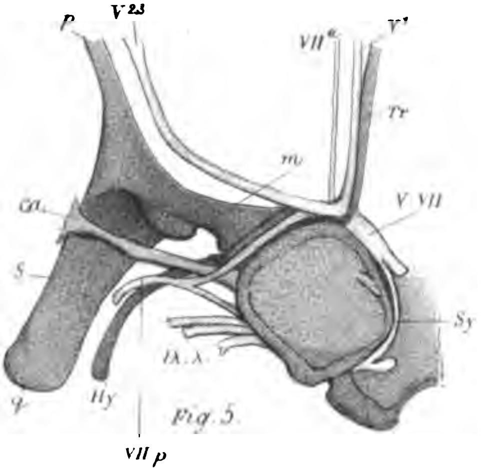

Fig. 5.

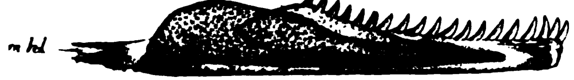

Fig. 7.

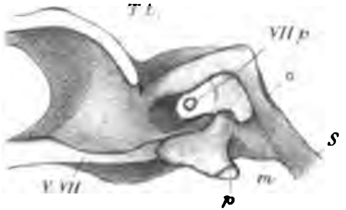

Fig. 6

W.H. Wesley lith.

M&N Hanhart imp.

MENOBRANCHUS. RANA. SIREDON. TRITON.

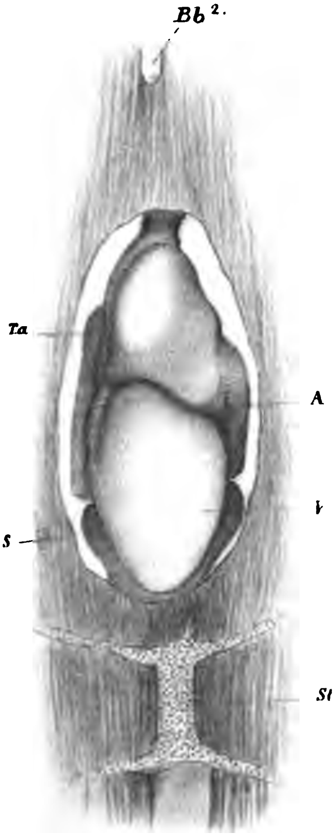

Fig. 1

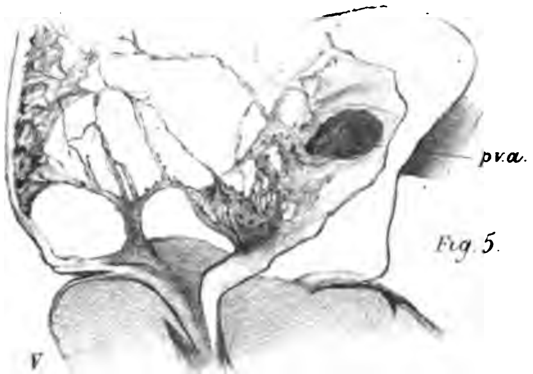

Fig. 5.

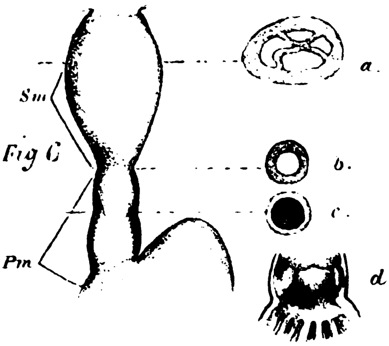

Fig 6

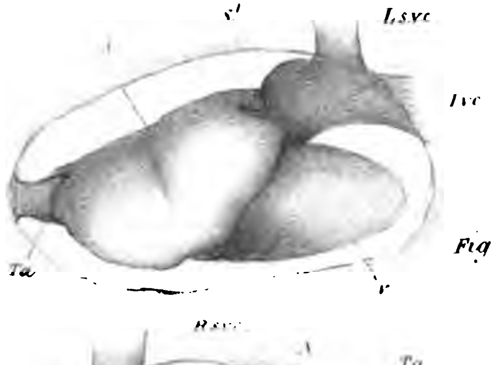

Fig. 2.

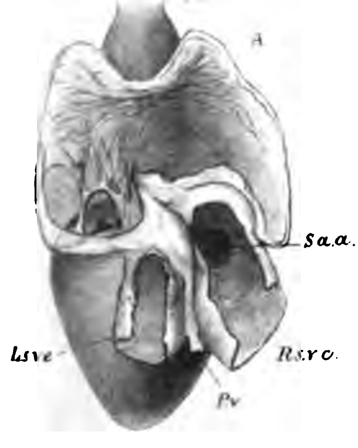

Fig 4.

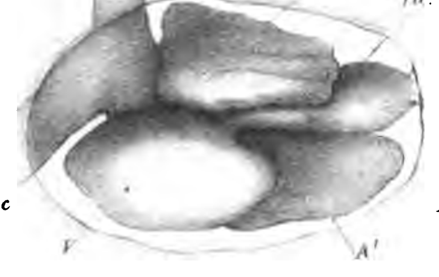

Fig. 3.

W H Wesley lith.

M & N Hanhart imp.

MENOBRANCHUS.

forwards and downwards." "As in *Menopoma*, the rami of the mandible are not ankylosed together, though the three pieces of each ramus are more closely united than in *Menopoma*. In the skull are distinguishable:—the articular portions of the occipital bone (*b*), which, below, appear not to be separate from the sphenoid (Keilbein) and vomer; above, however, they do not extend to the top of the skull. The parieto-temporal bones (Scheitelschläfenbeine) (*c'*), which are broad and arched, forming laterally the roof of the vestibule. The frontal bones (*c*). The long and bent quadrate bones (*n*). The pterygoid bones (*m*), with their teeth. Between them the great opening for the fifth pair (*x*)." "The nasal bones are wanting. The maxillæ (*k*) and the præmaxillæ (*f*)." A fair figure (tab. vii. fig. 2) accompanies this short notice, from which it is clear that Mayer's "maxillæ" are the vomers, and his "quadrate" the squamosal.

A short description of a skull of *Menobranchus* in the Museum of the Royal College of Surgeons is to be found in the first volume of the 'Catalogue of the Osteological Series,' p. 116. The prominent ossification of the epiotic bears the number appropriated to the "mastoid" by Professor Owen. Fischer ('Anatomische Abhandlungen über die Perennibranchiaten und Derotremen,' 1864) has given an excellent description and figure of the hyoidean and branchial arches of *Menobranchus*. The fullest account, and the best figure, of the skull of *Menobranchus* which I have met with, however, are contained in Van der Hoeven's 'Ontleed- en Dierkundige Bijdragen tot de Kennis van *Menobranchus*,' published in 1867. Van der Hoeven distinguishes the following bones:—the lateral occipitals (exoccipitals *mihi*), the *os sphenoideum* (parasphenoid), the *os pterygoideum* (pterygopalatine), the *os petrosum* (epiotic and opisthotic), the *os parietali-frontale* (parietal), the *os frontale anterius* (frontal), the *os frontale posterius* (prootic), the vomers, the *os tympanicum* (squamosal), and the *os jugale* (quadrato-jugal); in the mandible, the *os dentale* (dentary), and the *os angulare* (splenial).

In his description of the hyoidean and branchial arches, Van der Hoeven agrees with Fischer. As to the manner in which the hyoid is connected with the suspensorium, the latter writer observes that the ascending branch of the hyoidean cornu is connected by ligament with the posterior surface of the "os tympanicum." "In *Hypochthon* a second strong ligament extends from the dorsal apex of the hyoidean cornu to the lower jaw. In none of the other genera [of Perennibranchiata and Derotremata] have I observed this second attachment to the lower jaw. A tendon, which, in *Menobranchus*, runs external to the posterior point of the hyoidean cornu, parallel with the latter, downwards and forwards, belongs to the second portion of the digastric muscle." Nevertheless it will be seen that this second ligament exists no less in *Menobranchus* than in *Proteus*. It is also to be found in *Siren* and *Siredon*. None of the authors cited mentions the cartilaginous framework of the skull*.

The cranium of *Menobranchus* viewed from above (Plate XXX.

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* Stannius observes ('Handbuch. Die Amphibien,' p. 38), "Bei den *Proteidea* [*Proteus* and *Menobranchus*] sind die niedrigen Seitenwände der beiden vorder-

fig. 1) presents the form of a pentagon, with a deeply excavated base, and with the angle opposite the base truncated. This truncated angle corresponds with the ends of the premaxillary bones; the lateral angles are occupied by the extremities of the suspensoria, or pedicles to which the mandible is attached; the posterior angles answer to the epiotic processes of the skull of an osseous fish. As these project beyond the level of the occipital foramen, they give rise to the excavated contour of the base of the pentagon. The occipital condyles lie one on each side of and below the occipital foramen; and their slightly convex free surfaces look inwards and backwards. In a side view (Plate XXIX. fig. 2), the skull is seen to be much flattened from above downwards. The suspensorium is inclined downwards and forwards at an acute angle with the cranio-facial axis. The ramus of the mandible is proportionally stout and thick, and the hyobranchial apparatus, though almost wholly cartilaginous, is massive and large relatively to the skull.

The skull consists of a cartilaginous framework, in and upon which certain ossifications have been developed. The former is what is commonly termed the "primordial cranium;" but, as it is preceded by a membranous structure, it would be better termed the "chondrocranium," while the bony skull may be called the "osteocranium."

The *osteocranium* consists of the following bones:—

1. The *exoccipitals* (*E.O*).—These lie on each side of the occipital foramen, and bear the condyles. They do not come into contact either above or below; but the small space left between them is covered by the parietal bones in the former region, and by the parasphenoid in the latter.

2. The *epiotics* (*Ep.O*).—I term these interesting ossifications "epiotic" for brevity's sake. In reality they represent not only the epiotic but the opisthotic ossifications of other Vertebrata. They are conical caps of bone, which are separated by narrow cartilaginous interspaces from the pro-otics (*Pr.O*) in front, but closely unite with the exoccipitals behind and below. As usual, they shelter the posterior part of the organ of hearing; and the *fenestra ovalis*, with its stapes (*St*), is situated in the unossified interspace between the anterior and inferior (or opisthotic) part of the bone and the pro-otic.

3. The *pro-otic* ossifications (*Pr.O*) occupy their ordinary place in the front part of the capsule of the organ of hearing, and are covered above by the parietals (*Pa.*), and externally by the squamosals (*Sq.*).

4. The *parasphenoid* (*P.Sph*) is a very wide and thin bone, which extends from the lower margin of the occipital foramen, posteriorly, to a point beyond the middle of the length of the vomers, anteriorly. It underlies the exoccipitals, the epiotics, and the pro-

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sten Segmente der eigentlichen Schedelcapsel nicht ossificirt," and that they have an abortive cartilaginous antorbital process. He also mentions that the ligament which extends from the præmaxilla to the suspensorium contains particles of cartilage (eingesprengte Knorpel). I have not noticed these in my specimen.

otics behind, while, in front, the vomers underlie it on each side. Its anterior extremity is truncated, and slightly concave forwards.

5. The *vomers* (*Vo*) are much elongated, flattened, broader behind than in front, and have a sigmoid curvature, which is especially manifested by their inner edges. As the vomers come into contact only by their anterior extremities, while their inner edges diverge from one another backwards, there is left between them a wide space, increasing in breadth posteriorly, which is occupied, for the greater part of its extent, by the parasphenoid, but, in front of the truncated anterior termination of this bone, by a part of the chondrocranium. A series of teeth is set along the outer edge of each vomer; and its posterior excavated extremity articulates with the palatine bone.

6. The *parietal* bones (*Pa*) which are broad and flat, cover over the greater part of the epiotic and pro-otic bones. They meet in a median sagittal suture, which is about half as long as the whole skull. Anteriorly, each parietal bone presents three processes. The innermost of these (Pa^1) is the proper continuation of the bone; uniting with its fellow, it gives rise to the anterior half of the sagittal suture, and extends forwards, as a long triangular tongue, which is interposed between the two frontals (*Fr*). The second (Pa^2) and third (Pa^3) processes start from a common root. The inner, very long and slender, runs along the outer edge of the frontal bone, widening a little as it goes, and ends at the posterior boundary of the olfactory foramen (I). The third process (Pa^3) is short, passes downwards and outwards, and rests, in a manner to be described presently, upon a cartilage connected with the suspensorium*.

7. The *frontal bones* (*Fr*), separated behind by the conjoined parietals, unite, in front, in a long frontal suture, and terminate, anteriorly, in pointed processes, which are received between the ascending processes of the premaxillary bones. Between the latter and the olfactory foramen, each frontal is continued into a plate of bone (Fr^1), which lies on the sides of the snout. The anterior, pointed, extremity of this plate fits in between the ascending process of the præmaxilla and the vomer, while its posterior prolongation passes, below the olfactory aperture, to the cartilaginous antorbital process of the skull.

8. A *quadrate* ossification (*Qu*) of irregular form, occupies the distal end of the cartilaginous suspensorium.

9. The *palato-pterygoid* (*Pl. Pt*) is a flattened plate of bone, rounded and spatulate in front, where it articulates with the excavated posterior end of the vomer; truncated behind, where it underlies the suspensorium.

10. The *præmaxillæ* (*Pmx*). These are relatively strong bones, each composed of a horizontal "body" bounding the gape in front, and of a strong ascending process, which passes back on to the top of the skull, at an acute angle with the body of the bone. The "body" tapers off to a point posteriorly; and, in the specimen the skull of

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* Professor Owen considers that this process represents "the so-called columella of Lizards" (*l. c.* p. 116).

which I examined, there was no maxilla whatever, mere fibrous tissue connecting the end of the præmaxilla with the outer extremity of the antorbital process, and bounding the posterior nasal aperture externally. But in the skeleton of *Menobranchus* prepared by Hyrtl, now in the Museum of the Royal College of Surgeons, there is, on the right side, a minute bone bearing three teeth, which seems to be a rudimentary maxilla.

11. The *squamosals* (*Sq*) are long slender bones, which extend from near the extremity of the epiotic processes to the articular surface for the mandible on the extremity of the suspensorium. The whole bone is shaped somewhat like a boomerang—the half which lies against the outer side of the suspensorium being bent at an obtuse angle to the half which is connected with the pro-otic, parietal, and epiotic bones, and which runs parallel with the axis of the skull. Where the cranial and suspensorial portions of the bone meet, there is given off, from its posterior margin, a short osseous process, which is directed towards the stapes, covering over the ligamentous fibres which connect the stapes with the suspensorium.

12. The *dentary* (*D*) occupies the whole length of the mandible, rising up on its outer side into a high plate, curving inwards to the symphysis in the middle line, and extending as a shelf, grooved above, beneath Meckel's cartilage, which is received into the groove. Fourteen conical teeth are borne by this bone, and are ankylosed with it.

13. The *splenial* (*Spl*, Plate XXXI. fig. 7) lies on the inner side of Meckel's cartilage, and bears six teeth.

14. The only other ossified member of the cranial, or facial, series present in *Menobranchus* is the second basibranchial (Bb^2, Plate XXX. fig. 2), a styliform bone, broader in front than behind, which lies in the middle line, and articulates, in front, with the two anterior cerato-branchials (Cb^1).

The *chondrocranium*, in and upon which the bones now enumerated and described are developed, is a structure of an exceedingly remarkable character. The whole extent of the chondrocranium was ascertained by decalcifying the skull, macerating it afterwards in glycerine containing caustic potash, and then, partly, viewing it as a transparent object, and, partly, examining sections.

In the side walls of the depressed cranial cavity, between the parasphenoid and the second process of the parietal bone (Pa^2), there lies a rod of cartilage, which, at the anterior boundary of the orbit, is connected with the tapering antorbital process (*A.O*). It then bends inwards (on the inner side of the olfactory sac); and, meeting its fellow in the middle line, the two proceed, parallel with one another, to the end of the snout, their free extremities being embraced by the præmaxillæ.

The antorbital process is separated from the chief mass of this rod, which corresponds with one of the *trabeculæ* of the ordinary embryonic vertebrate cranium, by a line of fibrous tissue. In the internasal region, on the other hand, the anterior ends of the cartilaginous rods (which answer to the cornua of the trabeculæ) become fused together.

Posteriorly, each trabecula passes into the floor of a cartilaginous mass, which is formed, above, by the auditory capsule, and, behind, by the exoccipital, and which has undergone partial ossification. But, in spite of careful search, I could find no cartilage either in the supraoccipital, or in the basioccipital, region, but only a dense connective tissue. In the midst of this, in the basioccipital region, the conical extremity of the notochord is imbedded.

The large oval space included between the trabeculæ, their subauditory continuations, and the inferior and internal edges of the exoccipitals, is floored by fibrous tissue, in which the parasphenoid is developed, just as the roof of the skull is constituted by the fibrous tissue in which the parietals and frontals are formed. The side walls of the cranial cavity are constituted, behind, by the exoccipitals and auditory capsules, in front of these, by the trabeculæ; and, external to them, by the second processes (Pa^2) of the parietal bones.

The suspensorial cartilage presents, anteriorly and below, an oval, concave, articular facet for the articular end of Meckel's cartilage. Just above this, on the inner side, is a small elevation (*p*, Plate XXXI. fig. 4), which is all that represents the palato-pterygoid process of other *Amphibia*. Still higher up, on the inner side, the suspensorium gives off a broad, tongue-shaped, "ascending process" (*a*, Plate XXX. fig. 1), which mounts beneath the "third process" of the parietal bone, and applies itself to the outer side of the trabecular cartilage. The orbito-nasal (ophthalmic) division of the trigeminal nerve (V^1) passes beneath this tongue of cartilage, which therefore, morphologically speaking, ascends higher than the eye, inasmuch as the orbito-nasal nerve, as it passes forwards, runs above the optic nerve (Plate XXIX. fig. 1 and Plate XXXI. fig. 4).

The orbito-nasal nerve actually leaves the skull by a considerable foramen, common to it and the other divisions of the fifth ($V^{2,3}$), which lies between the trabecula internally and below, the pro-otic externally and behind, and the parietal bone above. And this foramen is undivided; but, as the ascending process of the suspensorium passes between the orbito-nasal nerve on its inner and anterior side, and the second and third divisions of the fifth on its outer and posterior side, it looks as if the process in question divided the foramen of exit of the trigeminal nerve into two parts.

The ganglia of the trigeminal and of the seventh nerves are situated, close together, above the trabecula, where it passes into the floor of the auditory capsule—the Gasserian ganglion lying in front of the anterior wall of the capsule, while the ganglion of the seventh, which is very closely connected with the auditory nerve, is placed rather on the ventral side of the anterior end of the capsule (Plate XXXI. fig. 4). Immediately in front of these ganglia, the trabecula is produced externally, and becomes continuous with the suspensorium by the process (*m*), which thus affords the middle and chief attachment of the suspensorium to the skull, and may be named the "pedicle of the suspensorium." Finally, the external and posterior angle of the suspensorial cartilage is produced upwards and backwards, on the exterior of the auditory capsule, with which it is closely adherent, into an *otic* process (*o*, Plate XXXI. fig. 4). The posterior division of the seventh nerve (which answers to what is commonly called the facial nerve, and may be termed the *hyo-mandibular* division of the seventh) runs directly in front of the auditory capsule, and beneath the otic process of the suspensorium. The anterior division (palatine or Vidian division) of the seventh, on the contrary, passes directly forwards, close to the pedicle of the suspensorium, parallel with the orbito-nasal, and below but external to it.

Meckel's cartilage (*Mck.*) is very thick at its articular end, but rapidly tapers off to a point beyond the coronoid enlargement, to which the elevators of the jaw are attached. The termination of Meckel's cartilage lies at a considerable distance from the symphysial end of the ramus of the mandible (Plate XXIX. fig. 1 and Plate XXXI. fig. 7).

The hyoidean arch has already been well described and figured by Fischer. It is entirely cartilaginous and fibrous. It consists (Plate XXX. fig. 2) of a long and stout *ceratohyal* cartilage (*C.h*), and a small *hypohyal* (*H.h*). The two *hypohyals* are united with one another by fibrous tissue, which represents the *basihyal*. Fibrous tissue connects the proximal half of the ceratohyal with the suspensorium and with the otic region of the skull; and a strong ligamentous band, the *hyo-suspensorial* ligament (*h.s.l*, Plate XXIX. fig. 1), passes from the ceratohyal, at about the junction of its middle and upper thirds, to the middle of the posterior edge of the suspensorium. From this point another strong fibrous bundle, the *suspensorio-stapedial* ligament (*s.s.l*), is continued upwards and backwards to the stapes. The hyo-mandibular branch of the seventh nerve (VII.*p*) passes above this ligament to its distribution, just as it passes above the *columella auris* in the Frog.

Rather above the attachment of the hyo-suspensorial ligament, another strong band of fibrous tissue arises from the ceratohyal, and, passing down on the inner side of the former, is inserted into the angle of the mandible. This may be termed the *mandibulo-hyoid* ligament, and answers to the interopercular element of the osseous fishes' skull (Plate XXIX. fig. 1 and Plate XXXI. fig. 7, *m.h.l*).

The branchial apparatus is composed of two median pieces, the *first* and *second basibranchials* (Bb^1, Bb^2); of which the former is cartilaginous, pointed in front, where it is connected with the fibrous representative of the basihyal, broad behind, where it unites with the two ceratobranchials (Cb^1).

The second basibranchial is the only portion of the branchial apparatus which is ossified, and has been described above.

The stout *anterior ceratobranchials* (Cb^1)* meet in the middle line, between the first and second basibranchials. The broad, dorsal end of each articulates with the correspondingly broad, ventral end of the first *epibranchial* ($Ep.b^1$), which is curved, and tapers to a point at its dorsal extremity.

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* Fischer (*l. c.* p. 19) considers that these represent the anterior and posterior ceratobranchials coalesced; but I see no evidence that such a process has taken place.

The *posterior ceratobranchial* (Cb^2) is a mere nodule of cartilage, which is connected, externally, with the anterior ceratobranchial and first epibranchial, and on its dorsal side articulates with the enlarged ventral end of the second epibranchial ($Ep.b^2$). The slender, slightly curved, third epibranchial ($Ep.b^3$) articulates with the enlarged ventral end of the second. There is no trace of a fourth epibranchial.

On comparing the cranium of *Menobranchus* with that of other *Amphibia*, one is at once struck (as Van der Hoeven has already remarked) by its many resemblances to that of *Proteus*.

In *Proteus*, the skull is similarly elongated and narrow, especially in the nasal and maxillary regions. The epiotic processes are prominent; and the suspensorium is inclined downwards and forwards at a like angle. The nasal, maxillary, and jugal bones are absent in *Proteus*, as in *Menobranchus*; the vomers and the palato-pterygoids have a similar disposition. In the general form and mode of attachment to the skull, in the rudimentary condition of the posterior ceratobranchial, in the presence of only three epibranchials, the hyoid and branchial apparatuses of *Proteus* closely accord with those of *Menobranchus*, though those of *Proteus* are much more extensively ossified. In both genera the epiotic and opisthotic regions ossify and give rise to a distinct bone, the summit of which forms the epiotic process. Moreover, the chondrocranium of *Proteus* is, in all essential respects, similar to that of *Menobranchus*, though the trabeculæ are partially ossified where they lie between the nasal sacs.

In possessing prominent epiotic ossifications, which project as strong conical processes from the occipital region of the skull, *Menobranchus* and *Proteus* differ from all other existing Amphibia, and agree with the extinct Labyrinthodonts *. In the absence of the fourth epibranchial, *Proteus* and *Menobranchus* differ from *Siren*, *Siredon*, *Menopoma*, and *Amphiuma*. In the rudimentary condition of the second ceratobranchial they approach *Amphiuma*, in which this element is absent.

In the structure of the chondrocranium, *Menobranchus* and *Proteus* differ from the Frog and from *Siredon* (the only Amphibia in which the chondrocranium has as yet been thoroughly examined) in the persistence, throughout life, of a far more embryonic type of structure. In fact, the skull of even the Lamprey is, in some respects, less embryonic than that of *Menobranchus*, the floor and roof of the occipital region having acquired a more complete chondrification in the Marsipobranch.

It is to the embryonic condition of the vertebrate skull, especially in the class to which *Menobranchus* belongs, that we must have recourse for an explanation of the structure of its primordial cranium.

If the cartilaginous skull of a tadpole, before it has lost its external gills, be compared with the persistent chondrocranium of *Menobranchus*, the general correspondence of the two becomes obvious (Plate XXXI. fig. 3). There is a very large pituitary space, bounded by the trabeculæ (*Tr*) at the sides. In front, the latter converge and coalesce into the internasal prolongations, which give rise to the mesethmoid of the adult Frog. But, in the tadpole, at this stage of its development, the "parachordal cartilages," which have been developed at the sides of the notochord, have united with one another and with the trabeculæ, and thus the pituitary space is much shorter than in *Menobranchus*. The cartilaginous skull of a tadpole of this age, in fact, has already obtained a higher development than it ever reaches in *Menobranchus*.

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* *Siren* and *Amphiuma* have epiotic processes of a different form.

The auditory capsules are rounded behind, in the tadpole, and do not extend backwards as pointed processes beyond the level of the exoccipitals; in which respect the tadpole's skull is more frog-like, and less fish-like, than that of the adult *Menobranchus*.

In the tadpole's skull, the suspensorium is attached to the trabecula of its side, close to the point at which the latter passes into the parachordal cartilage. The cartilaginous band (*m*, Plate XXXI. fig. 3), in fact, which passes into the trabecula, is the dorsal end of the mandibular arch, and corresponds with the pedicle of the suspensorium in *Menobranchus*, having the same relations to the ganglia and branches of the fifth and seventh nerves. In the adult Frog, the pedicle of the suspensorium has been carried outwards by the lateral growth of the auditory region of the skull, and is articulated by a joint* with the cartilage of this region, close to the outer extremity of the transverse arm of the parasphenoid. The inner process of the pterygoid lies on its ventral side, closely applied to it.

The elbow (*o*) by which the suspensorium of the tadpole abuts against the anterior and external face of the auditory capsule evidently corresponds with the *otic process* of the suspensorium of *Menobranchus*. In the adult Frog, the suspensorium, which is ossified only at its mandibular end, forks, at its cranial end, into two branches or crura, the interspace between which is filled by fibrous tissue (Plate XXXI. fig. 6). These crura, and the fibrous tissue which connects them, form the front wall of the tympanic cavity: the dorsal crus, which answers to the otic process, passes into the *tegmen tympani*, or roof of the tympanum, which is furnished by the outgrowth of the auditory capsule; the ventral crus is the pedicle of the suspensorium just mentioned.

Passing between the two crura (as Dugès long since pointed out) the seventh nerve enters the tympanum, closely applied to the inner wall of which (but not included in any Fallopian canal) it passes, above the level of the *fenestra ovalis*, over the *columella auris*. It takes, in fact, exactly the same course as in a mammal, except that it runs round the auditory capsule, instead of being included in a canal by the growth of the latter round it.

Some remarkable consequences appear to flow from the observed metamorphoses of the cranial end of the mandibular arch in the Frog. If the ossification which has already set in in the mandibular end of the suspensorium extended up into its dorsal crus, or otic process, we should have a quadrate bone, exactly like that of a Chelonian reptile. On the other hand, if the ventral crus became ossified continuously with the inner process of the pterygoid, and the basisphenoid were developed, we should have such a connexion of the pterygoid with the basisphenoid as exists in many Lizards and Birds [*]. Whence it appears to follow, that this part of the pterygoid represents the, morphologically, dorsal end of the mandibular arch, and that the dorsal end of the os quadratum is a secondary development of that arch, which becomes applied to the outer face of the auditory capsule.

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* My friend Mr. Parker, F.R.S., in his remarkable memoir on "The Structure and Development of the Skull of the Common Frog" (Philosophical Transactions, 1871), has given a different account of the origin of this singular articulation; but I believe I may say that he now agrees with me.

The articular surfaces for Meckel's cartilage are corresponding points in both *Menobranchus* and the Frog's tadpole; but the *palato-pterygoid* process (p), which is rudimentary in the *Menobranchus*, and far apart from the antorbital process ($A.O$) (the intermediate space being occupied only by membrane, bone, and connective tissue) is, though equally short, completely fused with the antorbital process in the tadpole.

There remain to be compared the orbital process (*Or.*) of the suspensorium of the tadpole and the ascending process (a) of the suspensorium of *Menobranchus*.

It is clear that the orbital process, if it grew upwards and inwards towards the dorsal side of the trabecula, might very well cover in the orbito-nasal branch of the fifth nerve, as it actually does in *Menobranchus*. But then it would also cover in the third division of the fifth and the levator muscle of the mandible, internal and anterior to which it lies in *Menobranchus*.

For these reasons I do not identify the "orbital process" of the tadpole's suspensorium with the "ascending process" of that of *Menobranchus* [†], though in some respects they are analogous.

In the tadpole, the tissue on each side of the notochord is so largely chondrified that it has formed a complete floor to the occipital and interauditory region of the skull, has roofed in the occipital region, and has coalesced with the auditory capsules; and the skull has attained this condition at a much earlier stage than that to which reference is here made [‡].

But I know of no condition of the skull of the Frog which is quite as instructive in its bearing on that of *Menobranchus* as is the skull of a Triton about the period at which it leaves the egg[*] (Plate XXX. figs. 2, 2a), or that of a larval Axolotl (Plate XXXI. fig. 1).

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[*] Stannius ('Handbuch d. Zootomie,' 2te Auflage: "Die Amphibien," p. 36) remarks, in giving the general characters of the skull in the "Amphibia Dipnoa," that the more or less cartilaginous pterygoid arcade in these animals is always connected with the rest of the skull in three places:—1, with the suspensorium; 2, with the sphenoidal region of the skull; 3, with the lower part of the anterior and outer wall of the orbital cavity. Of these "the connexion with the sphenoidal region answers to the articulation of the pterygoid with the basisphenoid in most *Streptostylica* [Lacertilia and Ophidia], Birds, &c.; the connexion with the lower part of the anterior wall of the orbit corresponds with the union of the pterygoid with the maxilla and jugal by means of an *os transversum* in *Streptostylica* and Crocodilea."

[†] A corresponding process exists in *Proteus*, *Siredon*, *Menopoma*, and *Amphiuma*.

[‡] See my Croonian Lecture (Proc. Roy. Soc. 1858), and, for full details, Mr. Parker's Memoir in the 'Philosophical Transactions' for 1871, already referred to.

Here the notochord occupies the centre of the future *basis cranii*, terminating in front in a rounded apex. The parachordal tissue exhibits no trace of chondrification; but it is very interesting to observe, on each side of it, the indication of an intermuscular septum, separating two myotomes, and thus indicating, so far, a segmentation of this region.

The auditory capsules are spherical sacs, which lie, quite isolated, on each side of the notochord, at some distance from it, and are not yet chondrified. The trabeculæ abut against the notochord posteriorly, but are wholly separate from any other structure. In front, they have begun to coalesce and to give rise to the broad internasal plate which is characteristic of the Salamandridea. On each side of them are seen the nasal sacs, with the minute posterior nares opening into the cavity of the mouth. Behind, and external to, each trabecula is a stout cartilaginous rod, which obviously represents the suspensorium; but the dorsal end of this cartilage (*m*), though it lies close to the trabecula, has not yet coalesced with it, and the mandibular arch is therefore quite free. The external angle (*o*) corresponds in its relation to the auditory capsule with the part similarly marked in the Frog's tadpole and in *Menobranchus*. At (*q*) is the articular surface for Meckel's cartilage (*Mck*); but neither "orbital," "ascending," nor "palato-pterygoid" processes are as yet developed.

The hyoidean arch (*Hy*, figs. 2, 2*a*) is as distinct and independent as are the mandibular and trabecular arches; it is an unjointed cartilage with a pointed dorsal end, which lies close to the auditory capsule. At its ventral extremity it coalesces with its fellow; while, behind, it is continuous with a median cartilage, which represents the basibranchials and ends in a long spatuliform style. From the sides of the median cartilage two ceratobranchials proceed, and are continued, the anterior into the first epibranchial, the posterior into the three other epibranchials. None of these parts are distinctly articulated, the future joints being, at most, faintly indicated. Sundry ossifications are visible in the fibrous tissue contiguous to the cartilages; thus the dentary (*D*) and splenial (*Spl*) pieces of the mandible, the squamosals (*Sq*), and the præmaxillæ (*Pmx*) (already one bone) have made their appearance.

The vomers (*Vo*), each of which bears two teeth, lie far apart, on the inner side of each nasal opening, and beneath the anterior end of the trabecula. Behind these are two dentigerous ossifications of the fibrous roof of the mouth, broad and rounded in front, but drawn out behind into a sort of tail, which is directed towards the suspensorium, though it does not reach the latter. These bones correspond with the anterior moieties of the palato-pterygoids of *Menobran-*

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[*] The observations on which the following statements respecting *Triton* rest, were made in 1858; but I did not publish them, as I could not then obtain the materials for completing the history of the development of the Triton's skull. Perhaps I shall be more fortunate this spring.

chus, and they occupy the same position as the palatines of the higher Vertebrata. But these bones, in fact, undergo very singular changes of position in the Salamanders. In the young *Siredon* (Plate XXXI. fig. 1) they have the general form and relations which they exhibit in all known Salamandrine larvæ; and, so long as *Siredon* retains its branchiæ, no important change takes place; but in the abranchiate *Siredon* (*Amblystoma*) and in *Amblystoma carolinæ* dentigerous bones, obviously identical with these, occupy the position of the palatine bones of the Frogs, lying transversely to the axis of the skull immediately behind the posterior nares *.

In the common Tritons and Salamanders, on the other hand, these bones, as Dugès originally observed, gradually incline backwards and inwards parallel with the base of the skull, coalesce with the vomers, and become the long dentigerous tail-like prolongations of the vomers, which adhere to the under surface of the parasphenoid. It can hardly be doubted that the so-called "sphenoidal" teeth of *Plethodon* and other Salamandridea are of the same nature.

Whatever direction the palato-dentary plates may take, however, they lose their primitive connexion with the pterygoid in all the Salamandridea, the anterior end of that bone and of its supporting cartilage moving outwards, and coming into connexion with the maxilla as it does in the Frogs†. The posterior nostril is, usually, bounded only by cartilage, or ligament, representing the antorbital process.

As the development of the *Triton* advances, chondrification takes place in the base of the skull on each side of the notochord; it extends backwards, to give rise to the occipital condyles, upwards, to form the occipital arch, and inwards, to constitute the basioccipital region; and the auditory capsules coalesce with the posterior extremities of the trabeculæ and with the *parachordal* cartilage thus developed. Moreover the internasal or mesethmoidal cartilage gives off expansions above and below the nasal sacs, which become the roofs and floors of the nasal chambers. But a large membranous fontanelle persists between the trabeculæ in the basi- and presphenoidal regions; and it is only in the Frogs that this intertrabecular or "pituitary" space appears to become completely chondrified.

Thus the chondrocranium of *Menobranchus* presents a little advance upon that of the larval *Triton* just leaving the egg, in so far as it possesses parachordal chondrifications, and in so far as the mandibular arch and the auditory capsules have coalesced with them and with the trabeculæ; but it is inferior to the chondrocranium of *Siredon* and of the ordinary Salamanders in the absence of subnasal and supranasal alæ, and in the want of a complete cartilaginous occipital segment.

No known Elasmobranch, Ganoid, or Teleostean fish presents so incompletely developed a chondrocranium as that of *Menobranchus*.

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* Profs. A. Duméril and O. C. Marsh have already noticed the change of position of these bones in Axolotls which became metamorphosed into *Amblystoma*.

† In the adult (branchiate) *Siredon* it is interesting to observe that the apex of the pterygoid cartilage already lies a little outside the outer margin of the palatine bone.

On the other hand, the latter is much like that of a Lamprey, if we leave the ossifications of the *Menobranchus* skull, and the accessory cartilages of the *Petromyzon*, out of consideration. And this fact, taken together with the curious resemblances in development between the Lampreys and the Amphibia (which are much closer than those between any of the higher Fishes and the Amphibia) *, suggest to my mind the supposition that, in the series of modifications by which the Marsipobranch type has been converted into that of the higher fishes, the most important terms must have been forms intermediate in character between the *Dipnoi* and the *Marsipobranchs*. The skeleton of such a fish as *Ceratodus*, if it had a *Menobranchus*-like chondrocranium, would approach that of the Lampreys more than that of any fish known at present; and it is not difficult to imagine the steps by which such a fish might be built up upon the "lines" of a Lamprey.

The bearing of the structure of the chondrocranium in *Menobranchus*, the larval *Triton* and *Siredon* upon the theory of the skull is obvious.

It is plain that three morphologically distinct elements enter into the composition of the cranium in these animals:—

1. The *parachordal* elements or "investing masses" of Rathke, which stand in the same relation to the notochord, in the skull, as the formative tissue out of which the bodies of the vertebræ are developed, in the spinal column.
2. The *pleural* elements or visceral arches, which are divisible into trabecular, mandibular, hyoidean, and branchial.
3. The *paraneural* elements or capsules of some of the organs of the higher senses.

The brain-case is a complex structure, formed by the coalescence of elements belonging to all three classes; the face, by the metamorphosis of visceral arches only.

The occipital portion of the chondrocranium, which lies behind the auditory capsules, and which, by its ossification, gives rise to the proper exoccipitals in Amphibia, and, in addition, to the basioccipital and supraoccipital in Osseous Fishes and the higher Vertebrata, appears in all cases to result from the metamorphosis and ossification of parachordal elements.

On the other hand, that portion of the chondrocranium which lies in front of the auditory capsules is, in the Amphibia, formed by the coalescence and metamorphosis of the trabeculæ. It is by their vertical growth that the relatively high lateral walls of the cranium of the Frog are formed; it is by their coalescence in the ventral median line that the pituitary space becomes completely floored with cartilage in the same animal; and it is by the outgrowth of alary processes from the coalesced internasal, or mesethmoidal, portions of the trabeculæ, that the roof and floor of the Frog's nasal capsules are produced.

Menobranchus is exceptional among the Amphibia in presenting no ossification of the substance of the trabeculæ in front of the pro-otic.

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* Unfortunately we know nothing of the development of the *Dipnoi*.

In all the other genera, so far as I am aware, these structures are ossified to a greater or less extent in front of the exit of the optic nerves.

In *Proteus*, the ossification is internasal only; in *Siredon* and *Menopoma*, it is interorbital only; in *Siren*, there are two extensive interorbital ossifications, which send median prolongations into the internasal septum, and thus afford a transition to the fully developed sphenethmoid (or "os en ceinture" of Cuvier) of the Frogs.

I see no reason for doubting the homology of the paired interorbital ossifications of *Siredon* with the orbito-sphenoids of the higher Vertebrata; in which case, that portion of the basis of the skull which arises out of the coalescence of these parts of the trabeculæ, and is ossified into one mass with them, in the Frogs, must represent the presphenoid; and if this be so, the floor and side-walls of the skull, between the interorbital ossification and the pro-otic bones, must answer to the basisphenoid and the alisphenoid; while that which lies in front of the interorbital ossification must correspond with the median and lateral ethmoids of the higher Vertebrates.

In the Amphibia all these parts are formed by the gradual extension and subsequent metamorphosis of the trabeculæ. All the steps of gradual enlargement, apparent outgrowth, and metamorphosis of these primitively rod-like cartilages can be followed; and no part of the chondrocranium in these regions is formed independently of them.

This is all I intend to convey by the expression that the sphenoidal and ethmoidal regions of the skull are products of the growth and metamorphosis of the trabeculæ. If the questions be raised, Have the trabeculæ, when once formed, a quasi-independence? and do they grow into the adjacent tissues, as a tree pushes its roots into the soil? Or does not their extension and apparent growth arise rather from a chondrification of the preexisting tissue in the immediate neighbourhood of the trabecular cartilage? it seems to me that no definite answer can be given to them.

In the larval *Triton* and *Siredon*, at the stage of development described above, for example, there is no complete cartilage either at the sides of the notochord, behind the trabeculæ, or in the ethmoidal region, in front of the trabeculæ. And it would seem that the cartilage which eventually exists in both these regions, arises in the same way—namely, by gradual chondrification of the tissue, beginning in that part which is in contact with the trabecula, and extending backwards, or forwards, as the case may be. And it may be said that if the apparent growth of the trabecula into the parachordal region is not to be described as a backward growth of the trabecula, so neither is the alisphenoidal, or orbito-sphenoidal, cartilage in the side-wall of the skull to be described as an upward growth of the trabecula; and this view would receive support from any cases in which the orbito-sphenoids, or alisphenoids, take their origin by independent development in the side-walls of the skull.

The same difficulty arises when we attempt to determine the nature of the cartilaginous walls of the nasal chambers. To all appearance these, in all Amphibia which possess them, grow out of the coalesced trabeculæ. But if it be said that they are independent chondrifications of the capsule of the olfactory sac, like those which certainly take place in the case of the eye and of the ear, and that the appearance of outgrowth from the trabeculæ is simply due to the fact that this independent process of chondrification begins in contiguity with the trabecula and extends outwards, I do not know that there is any means of deciding the question at present.

No doubt the perfect independence of the sclerotic and of the wall of the primitive auditory sac, lends countenance to the hypothesis that the olfactory sacs are provided with similar proper walls. And it is easy to imagine that the antorbital process and the ethmoidal alæ, taken together, may represent the sclerotic and the periotic cartilages; but it is very difficult to find proof of the fact, and, until such proof is produced, it may be better to enumerate the auditory capsules, alone, among the *paraneural* elements of the skull.

II. *The Heart.*

The heart of *Menobranchus* has been described by Mayer and by Van der Hoeven in the works already cited.

According to the former writer (*l. c.* p. 83),

"The heart is shaped like that of *Proteus anguinus*, and lies free in the pericardium. It consists of a ventricle and an auricle with two appendices (Herzohren), one on each side. The *truncus arteriosus* arises, as in the Batrachians, from the right corner of the ventricle. Upon each side, a *saccus venosus* appears beneath the appendix of the auricle of its side, and receives the corresponding superior vena cava. But in the pericardial chamber there are two inferior cavæ, formed by the division of the main trunk, which enters the pericardium at the upper edge of the liver. The right *saccus venosus* finally opens into the left; and out of this an aperture leads into the simple auricle, which, however, as has been said, presents two appendices.

"Near the sinu-auricular aperture the auriculo-ventricular opening (*ostium venosum*) leads into the ventricle. There are two auriculo-ventricular valves, with an interposed cleft. The ventricle is simple, but partially divided above by a median projection of its fleshy wall. The *bulbus aortæ* gives off two branches on each side; these pass towards the branchial arches; and the posterior again divides. The three branchial arteries thus produced run along the anterior edges of the branchial arches to the branchial plumes; from these the branchial veins pass along the posterior edges of the branchial arches, and, after uniting into a single trunk on each side, give rise to the *aorta descendens*. The existence of an anastomosis between the trunks of the artery and that of the vein of each branchia was indistinct; but small branches went to the branchial filaments.

"The pulmonary arteries arise from the trunk into which the branchial veins unite on each side. The pulmonary veins open, on each side, into the corresponding inferior vena cava. In addition, I found, but only on the left side, that a vein arose from the posterior vesicular end of the lung, which, uniting with a superior ovarian vein, passed directly into the *vena cava inferior*, as Rusconi has represented to be the case in *Proteus anguinus*. On the right side, a vein from the stomach opens into the pulmonary vein."

Van der Hoeven adds to this description a more precise account of the *truncus arteriosus* (which he terms arterial trunk, "slagaderlijken stam"), and its terminal dilatation into an elongated oval *bulbus arteriosus* (*l. c.* p. 30):—"At the origin of the *truncus arteriosus* lie three semilunar valves, and higher up beneath the *bulbus* three more. In the *bulbus* itself is a freely projecting solid plate, by which its cavity is almost divided into two semicanals."

He further states that the auricle "is divided by an imperfect septum;" but he gives no account of the form or structure of this septum.

In the specimen dissected by me, the heart (Plate XXXII. figs. 1 to 6) was lodged in an oval pericardial cavity, situated between the styliform second basibranchial and the curious chondrification of the *linea alba* and of the adjacent parts of the intermuscular septa, which Mayer (*l. c.* p. 85) justly interpreted as the sternum. Thick masses of longitudinal muscular fibres lie on each side of the pericardium, and represent the sterno-hyoid muscles.

The heart consists of a dorsal division, composed of the *sinus venosus* (*S*) and of the auricles (*A*), and of a ventral division, consisting of the ventricle (*V*) and the *truncus arteriosus* (*T.a*). The *sinus venosus* lies immediately over the posterior half of the ventricle, and is formed by the junction of the two inferior caval trunks described by Mayer.

The right and left superior cavæ (*R.s.v.c*, *L.s.v.c.*) open into these at their passage into the *sinus venosus*, and might fairly be said to communicate directly with the latter. The sinu-auricular aperture is situated in the right half of the posterior wall of the spacious auricular cavity. Though its lips project somewhat into the auricular cavity, they can hardly be regarded as truly valvular.

The auricular chamber is very spacious, and extends forwards nearly as far as the anterior end of the pericardium. It lies above the *truncus arteriosus* in front, and the anterior half of the ventricle behind. On each side, it is produced into a saccular dilatation, which extends over the *truncus* and ventricle to the ventral wall of the pericardium on the left side, but is much less developed on the right side, where it leaves the ventricle uncovered. The wall of the right dilatation presents three or four longitudinal folds.

On the dorsal face of the *sinus venosus*, between the two superior cavæ and the diverging inferior caval trunks, lies the pulmonary vein (*P. v.* fig. 4). It is very narrow posteriorly, but dilates in front, and, turning to the left, opens into the posterior part of the auricular cavity, to the left of the middle line.

The existence of the anomalous arrangement of the pulmonary veins in the specimen described by Mayer is therefore rendered doubtful, though I am unwilling to suggest that so accurate an observer was altogether mistaken.

The right wall of the dilatation of the pulmonary vein is continued downwards, forwards, and to the left side, nearly as far as the dorsal lip of the auriculo-ventricular aperture, as a delicate plate formed of muscular fibres, coated, on each side, by a layer of the cardiac epithelium. This plate represents the auricular septum; but it extends for but a very short distance forwards, and then, as it were, frays out into separate branched muscular bands, each of which is invested by its own epithelial cells. On the dorsal side, these bands proceed to be attached to the wall of the auricle about midway between its anterior and its posterior ends; but the ventralmost band makes an arch across the auriculo-ventricular aperture, and passes into a single muscular pillar, which is attached on the ventral side of that aperture. Anteriorly, this column branches out, and its divisions attach themselves to the left wall of the auricle and unite with the ramifications of the muscular bands proceeding from the dorsal side of the auriculo-ventricular opening (figs. 4 & 5).

The "plate," the "pillar," and the branched muscular bands which proceed from them, which have just been described, are all that represent the septum of the auricles, which therefore can have but little efficacy as a partition between the pulmonary and the systemic venous blood. These two kinds of blood must mix freely through the wide meshes of the network of fibres invested by epithelium; and it is only above and behind, where the meshes become closer and the network gradually passes into the impervious "plate," that the pulmonary blood can be guided to the auriculo-ventricular aperture by a special channel *.

The auriculo-ventricular valves are mere narrow folds of the endocardium, bounding the margins of the auriculo-ventricular aperture, which is triradiate, in consequence of a notch in its ventral lip.

The ventricle is oval in form; its cavity is small, directed transversely, and bounded by thick, spongy, muscular walls. The left end of the cavity communicates with the auricle; the right end opens into the elongated *truncus arteriosus*. The moiety of this *truncus* which lies nearest the heart is a tube, divided by a slight transverse constriction into two but little-marked dilatations.

As Van der Hoeven has stated, there are three semilunar valves set in a transverse row in the first dilatation, just above the aperture of communication with the ventricle, while three other such valves are disposed across the middle of the second dilatation. The division of the *truncus arteriosus* which contains these valves may be termed the "*pylangium*"*. The bulb-like termination of the *truncus arteriosus*, on the other hand, is divided into four canals by two septa disposed at right angles to one another, and is clearly formed by the coalescence of the aortic arches. It may therefore be termed the "*synangium*."

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* Stannius ('Handbuch,' p. 216, note) states that, according to his own and Hyrtl's observations, the separation of the auricles is apparently incomplete (*anscheinend* unvollkommen) in *Proteus*, *Menobranchus*, and *Siren*. As regards *Proteus*, in the only specimen I have dissected I have failed to find any trace of a septum; but in *Siren* I have found it complete, and extending between the auriculo-ventricular valves to terminate with a free edge, just as in the Frogs. According to Fritsch ("Zur vergleichende Anatomie der Amphibienherzen," Archiv für Anatomie, 1869), the septum is sometimes very imperfectly developed in adult (mässig kräftige) specimens of *Rana temporaria* and *R. esculenta*. A series of Frogs examined in the spring of 1860 exhibited this condition. But in these cases the septum was reduced to a fold of the auricular wall, while in the specimen of *Menobranchus* here described the septum extends nearly to the auriculo-ventricular aperture, but is perforated. I have not met with the condition of the septum described by Fritsch in adult Frogs.

Throughout the Amphibia these two constituents of the *truncus arteriosus* are readily distinguishable, though they vary very much in form and proportions, the pylangium being longest in proportion to the synangium in the Anura, shortest in the *Peromela*. Moreover, in the higher *Urodela* and the *Anura*, the pylangium becomes complicated by the development of a longitudinal septum, which extends from the anterior to the posterior set of valves, and imperfectly divides the cavity into two chambers.

DESCRIPTION OF THE PLATES.

PLATE XXIX.

Fig. 1. Side view of the skull of *Menobranchus lateralis*.
2. Ventral view of the same.

PLATE XXX.

Fig. 1. Dorsal view of the same, all bony matter being removed from the left half of the skull.
2. Ventral view of the hyoidean and branchial apparatus.

All the figures of the skull are magnified three times. In all, cartilage is coloured blue, and cartilage-bone light brown. Membrane-bone is left uncoloured.

The signification of the letters is the same throughout.

Cartilage-bones.—*E.O*, exoccipital; *Ep.O*, epiotic and opisthotic; *Pr.O*, prootic; *Qu*, quadrate; *St*, stapes; Bb^2, second basibranchial.

Membrane-bones.—*Pa*, parietal, with its three processes Pa^1, Pa^2, Pa^3; *Sq*, squamosal; *Fr*, frontal, with its antero-lateral prolongation, *Fr*. 1; *Pmx*, præmaxilla; *Vo*, vomer; *Pa*, *Pt*, coalesced palatine and pterygoid; *P.S*, parasphenoid; *D*, dentary; *Sp*, splenial.

Chondrocranium.—*Tr*, trabecula; *A.o*, antorbital process; *q*, quadrate process; *p*, pterygoid process; *a*, ascending process; *o*, otic process; *m*, pedicle of the suspensorium; *Mck*, Meckel's cartilage; *Hy*, hyoid arch; *Hh*, hypohyal; *Ch*, ceratohyal; Bb^1, first basibranchial; Cb^1, first ceratobranchial; Epb^1, first epibranchial; Cb^2, second ceratobranchial; Epb^2, Epb^3, second and third epibranchials.

Ligaments.—*m.h.l*, mandibulo-hyoid; *h.s.l*, hyo-suspensorial; *s.s.l*, suspensorio-stapedial.

Nerves and foramina for nerves; I, olfactory foramen; V, orbito-nasal branch of the trigeminal; $V^{2,3}$, second and third division of the trigeminal; VII.*p*, posterior division of the portio dura.

PLATE XXXI.

Fig. 1. Chondrocranium of a larva of *Siredon*. Fig. 2, of *Triton*, ventral aspect; fig. 2 *a*, hyoidean and branchial apparatus of the same *Triton*-larva.

In these larvæ the walls of the auditory capsules were not yet chondrified. Letters as before, except *N*, nasal sac; *Ch*, notochord.

3. Chondrocranium of a tadpole, dorsal aspect. V, trigeminal ganglion; VII, ganglion of the seventh nerve.
4. The suspensorium of *Menobranchus*; and fig. 5, that of *Rana esculenta*,

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* πύλη, a gate, and ἀγγεῖον a vessel.

with the adjacent parts decalcified. In *Rana* the dorsal crus, or otic process, has been removed to show the course of the posterior division of the seventh nerve (VII.*p*) over the columella auris, *C.a.* VII.*a*, the anterior division, palatine or Vidian nerve; *Sy*, commissural cord (sympathetic?) connecting the ganglion of the glossopharyngeal and pneumogastric (VIII. IX) with the coalesced ganglia of the fifth and seventh nerves (V, VII).

Fig. 6. A transverse section of the left half of the decalcified skull of *Rana esculenta*, to show:—*m*, the inferior crus or pedicle of the suspensorium; *o*, its superior crus continuous with the tegmen tympani, *T. t*, and the posterior division of the seventh nerve, VII.*p*, passing between these; V, VII indicate the place occupied by the conjoined ganglia of the fifth and seventh nerves.

7. The left ramus of the mandible of *Menobranchus*, viewed from within.

PLATE XXXII.

Fig. 1 ventral, fig. 2 left lateral, fig. 3 right lateral view of the heart of *Menobranchus lateralis*. Fig. 4. Dorsal aspect of the heart, with the auricles, sinus venosus, and cavæ laid open. Magnified 4 times.

5. Enlarged view of the septum of the auricles, from the left side.

6. The truncus arteriosus, with transverse sections (*a*, *b*, *c*), and laid open to show the posterior pylangial valves (*d*).

S, sinus venosus; *A*, auricular segment; *V*, ventricle; *T.a*, truncus arteriosus; *L.s.v.c*, *R.s.v.c*, left and right superior venæ cavæ; *I.v.c*, inferior vena cava; *S.a*, sinu-auricular aperture; *P.v*, pulmonary vein; *p.v.a*, opening of the pulmonary vein into the left auricle; *Pn*, pylangium; *Sn*, synangium.

2. Description of two new Species of Birds from Gaboon. By R. BOWDLER SHARPE, F.L.S., F.Z.S., &c., Senior Assistant, Zoological Department, British Museum.

[Received February 23, 1874.]

(Plate XXXIII.)

Mr. Henry Ansell has forwarded to the Museum a small collection of birds formed by him in the vicinity of the river Danger, Gaboon, during his leisure moments; and although most of the birds are well known, there appear to me to be two which are new to science. One of them is a *Centropus*, which I shall call, after its discoverer,

CENTROPUS ANSELLI, sp. n. (Plate XXXIII. fig. 1.)

Adult. Head and neck black, the former slightly glossed with greenish, the latter with purplish-blue shades, less distinct on the interscapulary region and upper back, which are dusky black; lower back and rump deep fulvous, with indistinct cross lines of black; upper tail-coverts black, with cross lines of fulvous; whole of the wing chestnut, darker on the coverts, the primaries dusky black at tip, the inner secondaries entirely blackish; tail black, the middle feathers with a few indications of fulvous cross lines at base; sides of face black like the head; entire under surface pale chestnut, the under tail-coverts barred with black and pale fulvous; under wing-coverts pale fulvous. Total length 23 inches, culmen 1·6, wing 7·5, tail 11·5, tarsus 1·9.

The measurements of this bird show that it is one of the largest of the African *Centropi*, finding its nearest ally in *C. francisci*. Indeed I suspect that the young birds from the Camma, doubtfully referred by Mr. Cassin to the latter species, are really the young of *C. anselli*; and thus it is probable that *C. francisci* is confined to the Gold Coast.

C. anselli wants the black throat of *C. francisci*, and is therefore easily recognizable. Its large size, black tail, and the fulvous colour of the lower back and rump sufficiently distinguish it from *C. senegalensis* and *C. monachus*. The discovery of this new species renders the table given by me (P. Z. S. 1873, p. 617) imperfect; and I therefore revise it.

a. Abdomen whitish or buffy white.	
a'. Throat white or buffy white.	
a''. With no perceptible superciliary streak.	
a'''. Head greenish black	1. *senegalensis.*
b'''. Head purplish blue	2. *monachus.*
b''. With a broad whitish eyebrow	3. *superciliosus.*
b'. Throat black	4. *francisci.*
b. Abdomen chestnut.	
c'. Larger: throat chestnut................................	5. *anselli.*
d'. Smaller: throat black	6. *epomidis.*
c. Abdomen black.	
e'. Wing-coverts barred with black.	
c''. Centre tail-feathers barred with fulvous	7. *nigrorufus.*
d''. Centre tail-feathers black................................	8. *grilli.*
f'. Wing-coverts rufous, not barred	9. *toulou.*

The other species discovered Mr. Ansell is, so far as I can make out, perfectly new to science, being a *Dryoscopus* with a rufous crown. I therefore propose to name it

DRYOSCOPUS CORONATUS, sp. n. (Plate XXXIII. fig. 2.)

Above glossy black, with a slight greenish gloss, the quills entirely black, the greater wing-coverts tipped with white, forming a broad wing-band, which is continued down the wing by means of a narrow white edging to the inner secondaries; head and nape chestnut; forehead and a narrow superciliary line fulvous; lores, sides of face, and ear-coverts glossy black; cheeks and entire throat and breast clear chestnut fawn-colour; abdomen, thighs, sides of body, and under wing- and tail-coverts pure white; bill and feet black. Total length 8 inches, culmen 1, wing 3·65, tail 3·7, tarsus 1·3.

Besides the two above described, Mr. Ansell has sent me the following birds:—

A specimen of *Coccystes jacobinus*. When I wrote my paper on African Cuckoos I was not aware of any instance of the capture of this species in Western Africa. The Museum, however, now contains two examples, as we have received it through M. Bouvier, from Dakar in Senegal, and now Mr. Ansell sends it from Gaboon.

Among the remaining skins forwarded by the latter gentleman are the following interesting species:—*Caprimulgus fulviventris*, *Cossypha cyanocampter*, *Rallus oculeus*, *Musophaga gigantea*, *Astur macroscelides*, *Accipiter melanoleucus*, *Polyboroides typicus*.

April 21, 1874.

The Viscount Walden, F.R.S., President, in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of March 1874 :—

The total number of registered additions to the Society's Menagerie during the month of March 1874 was 55, of which 5 were by birth, 24 by presentation, 19 by purchase, 2 by exchange, and 5 were received on deposit. The total number of departures during the same period by death and removals was 76.

The most noticeable additions during the month of March were as follows :—

1. A male Javan Rhinoceros, purchased March 7th for the sum of £800. A special report on this animal was read at the last meeting (see p. 182).

2. A specimen of a rare and little-known Parrot, Finsch's Amazon (*Chrysotis finschi*, Sclater), presented by Mrs. Chivers, March 9th.

I originally described this species in the Society's 'Proceedings' for 1864 (p. 298) from a single specimen in the British Museum.

It would seem that Souancé's upper figure of *C. viridigenalis* (Icon. Perr. t. 31), of which we have also two specimens living in the Gardens, may be intended for it. *Cf.* Finsch, Papag. ii. p. 545.

The only second example of *C. finschi* which I have met with is a skin in the collection of Messrs. Salvin and Godman, collected by Rébouch at Putla, in Western Mexico.

It is therefore with great interest that I was able to determine the Amazon presented by Mrs. Chivers on the 9th ult. as belonging undoubtedly to this rare species, of which I now exhibit an accurate coloured figure by Mr. Smit (Plate XXXIV.).

Communications were read from Dr. J. E. Gray, F.R.S., "On the very young of the Jaguar, *Felis* (*Leopardus*) *onca* ;" "On the young of the Bosch Vark, *Potamochœrus africanus*, from Madagascar;" and "On the skulls of the Leopard in the British Museum."

Mr. Edwin Ward, F.Z.S., exhibited and made remarks upon a pair of antlers of a large Deer obtained by Major Cathcart in the Crimea, which appeared to be those of the Persian Deer (*Cervus maral*).

The following papers were read :—

1. On the Introduction of Salmon to the Waters of Tasmania. By Morton Allport, F.Z.S.

[Received February 25, 1874.]

On the 4th of December, 1873, a Grilse (*Salmo salar*) fresh run from the sea, measuring 19 inches in length, and weighing *two pounds fourteen ounces*, was left in a small tide-pool in the estuary of the river Derwent in Tasmania, about thirteen miles below the head of the tideway.

As this fish had arrived at comparative maturity, there was not the same difficulty in determining its species as was experienced in the case of the Salmonoids which have frequently been caught during the last five years in the lower waters of the Derwent; and the Tasmanian Salmon Commissioners, after careful investigation, had no hesitation in pronouncing it to be a true salmon.

Well preserved in spirits, this specimen now graces the museum of the Royal Society of Tasmania at Hobart Town, and furnishes incontestable proof of the success of the greatest experiment in acclimatization that the world has yet seen; for it is certain that this fish must have been bred in the colony, the last salmon smolt from an English ovum having left the ponds at the river Plenty on its seaward journey in the month of October 1868.

2. Description of a new Species of Penguin from New Zealand. By Dr. O. Finsch, C.M.Z.S.

[Received March 7th, 1874.]

EUDYPTULA ALBOSIGNATA, n. sp.

All the upper surface, from the nostrils, along the temporal region and the sides of the neck, to the edge of the humerus, and along the sides of the body to the tibia, dark slate-coloured; the crown and middle of back darker, more slaty blackish; the hind neck and sides of the body brighter, more slaty bluish; all the feathers of the upper surface are slate-blue along the shaft, which is black; the loral region, sides of head, temporal region, and the upper half of the sides of neck are covered by a broad smoky-grey longitudinal stripe, which changes gradually into the dark colour of the upper parts, and on the lower parts also into the white which covers the whole under surface; upper surface of wing slate-black, but bordered anteriorly and posteriorly broadly with white, leaving thus only a dark median stripe; under surface of wing uniform white; tail-feathers white, with brownish shafts, and covered by a white patch, which is formed by the longest upper tail-coverts. Bill horn-black, the lower mandible reddish transparent; feet reddish brown; nails blackish.

Long.	alæ			rostri		Alt.	Long.	dig.		
tot.	tot.	cubitus.	manus.	a fronte.	a rictu.	rostr.	tars.	med.	ung.	
c. 15"	5" 2'''	1" 7'''	2" 5'''	1" 1½'''	2" 1'''	6'''	11'''	1" 4½'''	6'''	(poll. Angl.).

Two specimens of this species (male and female, which are alike) were forwarded to me through the kindness of Dr. Haast under the name *Eud. minor*. They had been captured near Akaroa on the South Island in September.

This species is easily distinguishable from *Eud. minor*, Gm. (= *E. undina*, Gould), by the broad white edge which borders the wing anteriorly and posteriorly, and by the white patch on the upper [illegible]. The bill is smaller and has a much more strongly marked [illegible] [illegible]. I have examined many specimens of *Eud. minor* and the so-called *Eud. undina*, but I never observed the peculiarities above mentioned, which, in my opinion, are of specific value.

3. On the Breeding of the Golden Eagle (*Aquila chrysaëtos*) in North-western India. By W. H. Unwin, Captain, Bengal Staff Corps.*

[Received March 16, 1874.]

On the 13th of May, 1873, three Goorkhas, soldiers of the regiment to which I belong, brought me a large dark-coloured Eagle, which they told me they had shot near its nest on one of the higher mountain-ranges near the cantonment of Abbottabád, in the Hazára district of the Punjab. They produced at the same time a young bird, also evidently an Eagle, which they stated they had taken out of the nest after shooting the old one. I at first sight supposed the latter to be a large *A. imperialis* in its dark or mature stage of plumage; but a close examination and comparison with the scientific descriptions induced me to alter this opinion, and to believe that the Eagle before me was no less than a specimen, and a very fine one, of *A. chrysaëtos*. I was further confirmed in this belief by correspondence with better ornithologists than myself, and also by data which I obtained while watching the gradual growth of the young bird, and which, as the result of being [illegible], I have given as fully as possible below. These data, though very roughly put together, are, in my opinion, of some value, as they serve to prove most indubitably that the Golden Eagle does (occasionally, at least) not only visit but actually breed within the geographical limits of India.

Before entering on a description of the young Eagle and his gradual development in growth and plumage, I think it well to give a short description of its parent, the situation and structure of her nest, and the general features of the country in which it was found. The Hazara district lies at the north-eastern corner of the Punjáb, contiguous to and on the left bank of the Indus, and subjacent to the high mountains which separate the Káshmir valley and its dependencies from the plains. It consists of a number of valleys of different elevations, sloping up gradually from the plains and surrounded by ranges of hills and upland plateaux, which are drained by streams and small rivers falling into the Indus. These lower ranges of hills are of various elevations, from 2000 to 6000 feet; and they and their interlying valleys are overlooked in the upper part of the district by mountains ranging from 7000 to 15,000 and 16,000 feet in height. These different elevations give great variety of situation and climate; and the district thus becomes a sort of debatable land on which the birds of hill and plain both meet, while the hilly and wooded nature of the country and its near proximity to Káshmir and Afghánistán make it a resort for many species of birds not often met with in other parts of India.

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* Communicated by Mr. R. B. Sharpe, F.Z.S.

It is unnecessary for me to give any detailed description of the plumage of the adult Eagle; suffice it to say that it corresponded in every point most exactly with the account of *A. chrysaetos* given in Dr. Jerdon's work.

The site of the nest (which I visited on a subsequent occasion) was well chosen for retirement and impregnability. A deep rugged gorge or ravine ran almost perpendicularly down the eastern face of a mountain nearly 9000 feet high. Its sides were steep and difficult of access, with precipitous cliffs and walls of rock, among the clefts and shelves of which deodars and pine trees of various kinds had succeeded in finding soil enough to cling to. This sort of ground was varied in places by steep slopes, slippery with dry grass and withered pine-needles, and generally ending in a perpendicular drop. The watercourse which formed the bed of the ravine below was quite inaccessible; and the mountain-sides above and around were clothed with dense pine-forest. Guided by the Goorkhas who had brought me the birds, I climbed with much difficulty down the face of the right bank of the ravine until I arrived at the tree which supported the nest. This was a large deodar, growing from a ledge which here ran along the face of the precipice, and overhanging a perpendicular drop of some 150 feet; the tree was of large size and destitute of lower branches, and, especially in such a situation, very difficult to climb; one of my Goorkhas, however, had succeeded in getting up by a small deodar which grew close by and almost touching the large one. In spite of the assistance this afforded the task was a very dangerous one; and the risk was greatly increased by the hostile attitude of the old birds (for both male and female were present), who came closer and closer to the climber with angry swoops, and would doubtless have attacked him had it not been for his companions at the foot of the tree, one of whom at length shot the female eagle as she sailed close past him.

The nest, which was about 30 feet up in the tree, was a solid though rough-looking structure, built of dry and withered pine-branches and other wood. Some of these were of a much greater size than any Eagle would be deemed capable of lifting; and some, from their appearance, must have been broken off the trees in their green state. The whole formed a mass about 6 feet high and 4 feet broad at top, and must have weighed several hundredweight. It rested against the main trunk of the tree, and was supported by and interlaced with the branches in its neighbourhood. The top was littered roughly with grass and roots, which formed a kind of lining for the young bird to rest on.

The latter when first brought to me was not, as far as I could judge, more than ten days old. He was as large as a moderate-sized fowl, and entirely covered with white down, the cere and feet yellow, bill and claws black, irides dark brown.

His gradual progress is noted below in the form of the rough journal which I kept at the time, viz.:—

May 31.—The young Eagle has now been here 18 days, and has grown a good deal in the time. A few dark brown feathers are beginning to sprout among the downy coat on the shoulders, back, and wing-coverts. He eats freely, his food consisting of small birds, which are shot for him daily; they are cut to pieces, and given with the feathers still adhering to them.

June 15th.—Great increase in dark brown plumage. Quills and rectrices are developing rapidly; and the lanceolate golden-chestnut feathers characteristic of *A. chrysaëtos* are beginning to show on the nape and occiput. Is much increased in size and strength, and appears to thrive well generally, but is very impatient of the heat, which has now set in.

July 1st.—Plumage rapidly developing, everywhere showing an exact similitude to that of the mother, with the exception of the tail, which begins to show the white basal ring typical of the Golden Eagle in its first plumage. The central quill-feathers have also their basal half quite white on both webs; this becomes gradually mottled till it passes into the dark brown of the terminal half of the feather. Similar feathers in the mother have their basal halves of a dark grey, densely clouded and spotted with blackish brown. Claws and feet have much increased in power; and the golden brown hue of the head, occiput, and shoulders is becoming very distinct. The bird is now up in the hills with me, and appears to enjoy the cool climate immensely. He frequently utters a loud continuous discordant cry, very difficult to imitate or describe in writing; it is something like *chee-aw*, *chee-aw*, *chee-aw*, repeated quickly for half an hour at a time. I observe that this cry becomes louder and more strenuous if he sees any Kite or other raptorial bird passing overhead. Is very quiet and gentle with people who go near him, but made a fierce rush at a small terrier who came within his reach. Is now quite capable of tearing up birds for himself, and gets through a great number in the course of the day.

August 1st.—Has grown a great deal during the past month, and has everywhere assumed the dark brown plumage shown in his mother, except on the inner and lower parts of the thighs and tarsi, where a good deal of white down remains uncovered. The head has assumed its full covering of lanceolate golden-chestnut feathers; and the same colour is apparent on the shoulders and in front of the thigh-coverts. It is everywhere of a darker and richer shade than in the mother, owing probably to its not having been exposed to the weather. The claws are very large and powerful for so young a bird. Feet bright wax-yellow; cere and lips lemon-yellow; irides of a much brighter and clearer brown than when first taken; the tail is large and well grown, with white basal ring well developed. Plumage generally sleek and glossy. Disposition shy and timid, as a rule; but every now and then he shows signs of a fierce temper. I have tried him with various kinds of birds in feeding him, and find that he shows considerable discretion. Any kind of Dove or Pigeon, or Partridge is at once recognized and devoured; he will also accept, but less readily, Crows *, Jays †, and Mainas ‡, and such like; but any thing in the shape of raptorial birds, such as Kites, Buzzards, &c., is rejected at once, thereby proving the truth of the proverb that "Hawks pyke not out hawk's een."

September 1st.—Has grown considerably during the past month, and plumage now appears fully developed; no changes of any importance have occurred in his appearance and habits.

October 1st.—No changes in plumage, but steadily increases in size. Occasionally shows a savage temper with any one who approaches him. The dogs keep at a respectful distance; but a fowl who ventured within his reach was caught and killed instantly. I occasionally give him a chicken as a treat, and am much struck by his mode of killing it: having seized the victim in his powerful gripe, he makes no attempt at using his beak, but remains with head erect, looking in a defiant manner at any one standing near him, and meanwhile killing the fowl by the simple compression of his powerful talons. Having completely killed it in this fashion, a process which does not take more than a minute, he turns away, still holding it in his grasp, and endeavours to shield it from the sight of observers by spreading his wings over it (this is a peculiarity of all Falcons); and finally, using his beak for the first time, he tears it in pieces and swallows them till not a vestige, except a few of the larger feathers, is left.

November 1st.—Is evidently still growing, and is getting more savage in his temper. The cry before alluded to has ceased; and the bird appears to enjoy the cold weather which has now set in.

January 1st, 1872.—No change in size or plumage has occurred during the past two months. The bird thrives well, but is getting very savage and aggressive in his temper.

March 1st.—Nothing worth noting since last observations were recorded.

May 1st.—Is now nearly a year old, has not grown to any appreciable extent since last autumn; and plumage remains unchanged; no signs of moulting at present. Temper very savage, and I have been obliged to secure him by a strong cord fastened to a strap on one of his legs; he generally rushes to the full length of the cord, and attempts to seize people who approach him. The man in charge of him has no sinecure; and the office of carrying him from the tree under which his perch is placed for the day to the verandah where he is kept at night is one of considerable danger. He would be more awkward to handle and approach than he is were it not that he appears to regard his claws as his only weapons of offence, not dreaming of using his very formidable beak. This peculiarity is shown, as I have said before, in the act of killing a fowl, which he never touches with his beak until it is to all appearance dead from the pressure of his talons. The loud cry that had ceased last autumn has recommenced, and his impatience of confinement is

* *Corvus splendens* and *C. culminatus*. Common in Hazára.

† *Garrulus lanceolatus* and *G. himalayanus*. Common in Hazára.

‡ *Acridotheres tristis*. Common in Hazára.

much greater, probably caused by the presence of spring and the increasing heat.

August 1st.—The bird has not shown any remarkable changes of any sort since last notes were made.

September 1st.—Escaped from confinement about a fortnight ago, and, though pinioned, managed to get lost down a steep hill-side covered with pine-forest. He was ultimately, after a week's absence, caught and brought back by a villager, who found him sitting in a ploughed field at some distance from the hill he had escaped down. I fear the bird has received some injury during this escapade, as he pines and often refuses his food, and seems weaker, and smaller almost, than he used to be. His plumage has fallen off and become more draggled during the past two or three months. I partly attribute this to moulting, and partly to confinement being more irksome in the summer than in the winter months.

4. Description of a new Species of Woodpecker from British Burmah. By Lieutenant R. Wardlaw Ramsay, F.Z.S.

[Received April 1, 1874.]

(Plate XXXV.)

The following is the description of what appears to me to be an entirely new species of Woodpecker. I obtained examples of both sexes in a teak-forest, about six miles to the north of Tonghoo, in British Burmah.

GECINUS ERYTHROPYGIUS, n. sp. (Plate XXXV.)

Male. Head, sides of face, ear-coverts, and occipital crest black, with a red patch on the crown; a superciliary streak running from the top of the eye to the nape whitish, but gradually blending into the yellow of the neck.

Throat, neck, and upper part of breast yellow, with a green tinge throughout. Back, wing-coverts, and upper tail-coverts green; lower back and rump bright crimson, with some of the feathers green at the base.

Quill-feathers brown, the outer web of the primaries slightly suffused with green, and the outer web of the secondaries wholly green on the upper surface. Each feather with eight or nine white spots on either web.

Tail dark brown, with one or two white spots at the base of the feathers. Two centre feathers margined green on both webs. Whole under surface dusky white, each feather with two faint scale-shaped brown lines, which are broader and more distinct on the thighs and lower tail-coverts. Lower wing-coverts white, with two irregular brown bars across each feather, and edged pale green.

The *female* differs from the male in having the head entirely black, and by wanting the superciliary streak. The markings of the wings and underparts are also less boldly defined.

Iris yellow; bill dark greenish brown; legs greenish plumbeous.

Dimensions in the flesh.

	Length.	Wing.	Tarsus.	Tail.	Bill at gape.	Bill at front.
♂....	13·2	6·5	1·2	imperfect	1·55	1·3
♀....	13·1	6·5	1·2	5·5	1·5	1·25

5. Monograph of the Genus *Saxicola*, Bechstein. By W. T. Blanford, F.R.S., F.Z.S., &c., and H. E. Dresser, F.Z.S. &c.

(Plates XXXVI.–XXXIX.)

[Received April 21, 1874.]

The following pages contain an attempt to reduce into something like order the excessively confused nomenclature of the species composing the genus *Saxicola*. Having had the advantage of a very large number of specimens for comparison, and having examined most of the original types described by Ehrenberg, Rüppell, Tristram, Salvadori, Cavendish Taylor, Hartlaub, and Finsch, we are enabled in many cases to state positively what are the species named by those naturalists.

This paper was commenced more than a year ago, under the following circumstances:—One of us was engaged in working out the names of the birds of Europe, and with this intent had collected, by the kindness of several friends, a large series of different Chats; the other had just returned from Persia bringing with him a considerable number of species of the same group. Amongst the united collections (which, besides those of the writers, comprised extensive suites from the cabinets of Lord Walden, Canon Tristram, Messrs. Sharpe, Howard Saunders, Shelley, Cavendish Taylor, and Hargitt) were representatives of all the forms known from the Palæarctic region and of a large majority of the African species; and we soon ascertained that several alterations were necessary in the received nomenclature, many forms being known by incorrect names, whilst others had been separated on account of differences which were due to age or sex. As it was necessary for each of us to study several species for our own works, we agreed to take up the entire genus together and endeavour to determine the nomenclature of the whole. The task proved more tedious and more difficult than we had anticipated; but the synonymy of several of the species was sufficiently determined some months since for their names to be published in the 'Birds of Europe.' In the names given in the earlier numbers of the same work some errors occur, which will be found corrected in the present paper; and corrected sheets will be issued in that work. To all the gentlemen who have thus liberally assisted us by the loan of their collections we are greatly indebted; and we are equally obliged to Dr. Cabanis of the Berlin Museum, Dr. Finsch of Bremen, and Count Salvadori of Turin, all of whom, besides showing us every possible attention, and affording us all the assistance in their power on the occasion of our visits to their Museums, most kindly allowed us to take away typical specimens for comparison. To Dr. Finsch we are still further indebted for his having lent to us the whole of his manuscripts relating to *Saxicola* and its allies, containing most valuable notes and identifications.

Besides the museums above mentioned, we have visited those of Paris and Frankfort, and examined the fine series of skins in the British Museum.

So far as regards the species of the genus found in the Palæarctic region, the numerous described types which we have had the advantage of examining, and the extensive series of specimens which we have been able, by the kindness of our friends, to compare, have given us great advantages in the study of the different forms, the majority of which, moreover, had been personally collected by one or the other of us in different parts of Europe, Persia, India, or Abyssinia. We feel far less confidence in our determinations of the South-African *Saxicolæ*, both because they are less known to us, and because many of the species, founded on figures and descriptions in the works of the older authors, the types of which are unknown, render identification most difficult. This is especially the case with the species usually known as *S. monticola*, Vieill., *S. cinerea*, Vieill. (*S. tractrac*, Boie), and their allies; and we think it not improbable that some forms, which, for want of sufficient information, we have kept distinct, may be merely different phases of the same species, the distinctions being due to age or sex.

It is exceedingly difficult to define accurately the limits of the genus *Saxicola*, and to decide which of the numerous genera into which it has been divided by systematists are really entitled to separation. It is almost impossible to express in words the distinctions between generic groups which, although the typical forms are well marked, are connected by so many links as those which are found in the *Saxicolinæ* and other subdivisions of the great natural family which comprises the Thrushes and Warblers. In the genus *Saxicola*, as defined by us, we have species which seem nearly as closely allied to *Pratincola, Ruticilla, Thamnolæa* and *Monticola* as they are to *Saxicola œnanthe.*

There is no important characteristic structural distinction, so far as we know, between several of these allied genera. If any character is more constant than the rest in *Saxicola*, it is the pale or white coloration of the feathers at the base of the tail; yet we feel obliged to admit some species in which this is wanting, and to omit others which exhibit it.

In the forms which we include, besides the species closely allied to *Saxicola œnanthe*, are those for which the generic name *Dromolæa* was proposed by Cabanis (the type being *S. monticola*, Vieill.), and those referred to *Campicola* of Swainson (type *S. pileata*, Gm.). At the same time we consider that *Pratincola* (type *P. rubetra*, L.), which has muscicapine affinities, *Cercomela* (type *C. melanura*, Rüpp.), which leads to *Ruticilla*, *Agricola* (type *A. infuscatus*, Smith), *Myrmecocichla* (type *M. formicivora*, Vieill.), *Thamnolæa* (type *Th. cinnamomeiventris*, Lafr.), and *Oreicola* (type *O. pyrrhonota*, Vieill.) are fairly distinguishable as separate generic groups, though all closely allied to the true *Saxicolæ*.

The genus *Saxicola* was originally established by Bechstein, in 1802 (Ornithologisches Taschenbuch von und für Deutschland, p. 216), and comprised *S. œnanthe*, *S. rubetra*, and *S. rubicola*. The two latter species were separated as *Pratincola* by Koch in 1816 (Baier. Zool. p. 190, pl. v. *a*, fig. 38), *P. rubetra* being the type. In the same year the generic name *Vitiflora* was given by Leach to *Saxicola œnanthe* in his 'Systematic Catalogue of the British Museum,' p. 21; whilst a third generic term, *Œnanthe*, was given also in the same year by Vieillot ('Analyse Nouv. Orn. Elém.' p. 43). Vieillot added a large number of species taken from the works of Levaillant and others in the 'Nouveau Dictionnaire d'Histoire Naturelle,' vol. xxi. Art. *Motteux*. In 1827 Swainson proposed the genus *Campicola*, with *Le Traquet imitateur* of Levaillant (*S. pileata*) as the type. This is a somewhat stouter form than typical *Saxicola*; but there is so complete a passage from one to the other that we cannot separate them.

Meantime a large number of forms had been added to the genus by Lichtenstein, Hemprich, Ehrenberg and others, until the number of species assigned to it by Mr. G. R. Gray in his 'Genera of Birds' (1849), p. 179, amounted to 33. In the course of the 20 years which elapsed between the appearance of the 'Genera' and that of the 'Hand-list,' that number, including the species referred to various subgenera, had swollen to 69; and a few additional species have been described since. In the present monograph we have reduced the number to 37; but we exclude from the genus 12 of the species included in Mr. Gray's first work, and 15 of those enumerated under various subgeneric groups in the second.

We have prefaced the descriptions of the species belonging to our genus by an analytical synopsis, in which all the forms are classed according to the coloration of the males, or of the birds supposed to be males.

In the synonymy we have only included, as a rule, a quotation from the first proposer of each different specific name. We have endeavoured, to the best of our power, to disentangle the confused nomenclature which exists; and we think it will be found that we have considerably diminished the list of nominal species. Something more in this direction perhaps remains to be done amongst the South-African forms.

The genus *Saxicola*, as understood by us, ranges throughout Europe, Western and Central Asia, and the whole of Africa. One species extends to North America; but the genus is unrepresented in the remainder of the American continent, Australia, and the Indo-Malay region, such species as are included in the Indian fauna being found in the central and north-western parts of the Indian peninsula in winter only. There is a remarkable difference between the Palæarctic forms and those found in the Ethiopian region: the former are without exception migratory; the latter, excepting a few which pass the summer in Europe, Northern Africa, or Asia, and the winter in tropical Africa, are non-migratory, and many of them appear to be very locally distributed.

SAXICOLA.

Saxicola, Bechst. Orn. Taschenb. p. 216 (1802).

Bill straight, rather broad at the base, rather longer than the middle toe with claw, compressed, decurved, and more or less indented at the tip. Nostrils basal, supernal, and oval. Gape furnished with a few bristles. First primary very short, second shorter than the third and fourth, third or fourth the longest; coverts and scapulars short. Tail nearly even, the basal portion nearly always white or rufous. Tarsus long, covered in front by one long scale, to which succeed two or three shorter ones. Claws compressed, strong, and moderately curved; the outer toe partly united to the middle toe; lateral toes equal or subequal.

Section I. *Back and shoulders in the males black or blackish.*

A. Uropygium rufescent.
   22. *lugubris*, Rüpp. Throat and breast black.
   7. *mœsta*, Licht. Breast white.

B. Uropygium white.
   a. All the under parts white.
      3. *vittata*, Ehr. A dark band from the lores to the shoulders.
   b. Abdomen white; throat entirely black.
      12. *albonigra*, Hume. Head entirely black; sexes alike; wing 3·9 inches.
      13. *picata*, Blyth. Head entirely black; sexes dissimilar; wing 3·5.
      10. *leucomela*, Pall. Head whitish above; sexes alike; under tail-coverts rufous; inner quill-webs white; outer tail-feathers black-tipped.
      11. *morio*, Ehr. Head whitish above; sexes alike; under tail-coverts white or pale buff; inner quill-webs black; outer tail-feathers black-tipped.
      14. *monacha*, Rüpp. Head above white; sexes dissimilar; bill elongate; outer tail-feathers white.
   c. Lower parts, except crissum, entirely black.
      16. *leucura*, Gm. Head always black; general colour dull black; central rectrices white at base; female sooty brown. Culm. 0·91, tarsus 1·08.
      15. *leucopyga*, Br. Crown in adult white; general colour jet-black; central rectrices white at base; female similar to male.
      23. *atmori*, Tr. Head black; general colour sooty black; central rectrices black throughout (distinguished from *S. leucura* by blacker rump and more black on the rectrices). Wing 4·1.

17. *opistholeuca*, Strickl. Similar to *S. leucura*, but smaller. Culm. 0·6, tarsus 0·9.

Section II. *Back in the males black; shoulders white.*

24. *monticola*, Vieill. Entirely black, except abdomen and shoulders.
25. *arnotti*, Tristr. Supercilium white; crown white and black intermixed; entire underparts black.
26. *leucomelæna*, Burch. Crown grey; rump, upper and under tail-coverts, base of rectrices, and abdomen white.
27. *griseiceps*, sp. nov. Head and nape ashy grey; otherwise not unlike the preceding species.

Section III. *Back in the males cinereous.*

1. *œnanthe*, L. A black mark through the eye; underparts whitish; wings black; sexes dissimilar.
29. *cinerea*, Vieill. No black mark through the eye; throat and breast pale cinereous; rump and outer edges of all tail-feathers, except central pair, white; second primary emarginate at tip.
30. *pollux*, Hartl. No black mark through the eye; throat and breast cinereous; rump similarly coloured to the back; external edges of outer rectrices white; second primary emarginate at tip.
31. *castor*, Hartl. No black mark through the eye; underparts cinereous throughout; rump and basal portion of all tail-feathers, except the two central pairs, white; second primary not emarginate at tip.
28. *diluta*, sp. nov. No black mark through the eye; upper parts to the rump pale cinereous; rump and basal portion of all tail-feathers except central pair white; shoulders white or whitish; second primary not emarginate.

Section IV. *Back in the males neither black nor cinereous.*

A. Interscapulary region in adult white in breeding-plumage, rufescent or greyish in winter; wings blackish; sexes dissimilar.
  a. Underparts white in breeding-plumage.
    2. *stapazina*, L. Black band through the eye; throat white.
  b. Throat black.
    4. *rufa*, Brehm. Black on the throat not extending far down the throat; upper parts white in summer, rufescent in winter.
    5. *melanoleuca*, Güld. Black on the throat extending very far down, to the top of the breast; upper parts white in summer, rufescent in winter.
    6. *erythræa*, Ehr. Black extending to the upper breast, and joining that colour on the flanks; upper parts white in summer, greyish in winter.

B. Feathers on the interscapulary region intermixed black and rufescent; wings black.

37. *bifasciata*, Tem. Brown; throat and upper breast black; supercilium, lower breast, and abdomen rufous; tail entirely black.

C. Interscapulary region similarly coloured to wing-coverts.

a. Throat black.

9. *deserti*, Rüpp. Upper parts sandy brown; lower parts from breast rufescent white; terminal half of outer tail-feathers black; tail-coverts whitish.

8. *xanthoprymna*, Ehr. Upper parts cinereous brown; lower parts from breast whitish; tips of outer tail-feathers alone black; tail-coverts ferruginous.

b. Throat white; breast and crown black.

36. *pileata*, Gm. Back reddish brown; rump ferruginous; abdomen whitish.

c. No black on underparts.

32. *albicans*, Wahlb. General colour pale isabelline grey above, white below; tail-coverts and base of all the tail-feathers white; second primary not emarginate at the tip.

33. *schlegeli*, Wahlb. General colour pale isabelline grey above, white below; outer edges of external rectrices white; rump white; second primary emarginate at the tip.

18. *isabellina*, Rüpp. Sandy brown above, isabelline below; tail-coverts and base of outer tail-feathers white.

20. *bottæ*, Bon. Dull dark brown above; throat white; breast and abdomen ferruginous; base of outer tail-feathers white. Wing 3·75.

21. *heuglini*, Finsch. Dark brown above; throat white; breast and abdomen ferruginous; base of outer tail-feathers white. Wing 3·35.

19. *chrysopygia*, De Fil. Hair-brown above, brownish white below; tail-coverts rufous; base of outer rectrices ferruginous; first long primary not emarginate.

34. *galtoni*, Strickl. Upper parts dark brown, lower parts pale brown; tail-coverts and base of outer rectrices ferruginous; first long primary not emarginate.

35. *sinuata*, Sund. Upper parts brown, lower parts pale ashy brown; rump and extreme basal portion of rectrices rufous; first long primary very deeply emarginate near the tip.

1. Palæarctic Species (all migratory).

1. Saxicola œnanthe.

Motacilla œnanthe, L. Syst. Nat. ed. 12, vol. i. p. 332. no. 15 (1766).
Motacilla vitiflora, Pall. Zoog. Ros.-As. i. p. 472. no. 112 (1811).
Œnanthe cinerea, Vieill. Nouv. Dict. xxi. p. 418 (1818).
Le Motteux de Sénégal, Buff. Ois. vi. p. 136, pl. 583. fig. 2 (1783).
Motacilla leucorhoa, Gm. Syst. Nat. i. p. 966 (ex Buff.) (1788).
Saxicola rostrata, Ehr. Symb. Phys. Av. fol. *aa* (1829).

Saxicola libanotica, Ehr. Symb. Phys. Av. fol. *bb* (type examined) (1829).

Saxicola septentrionalis, grisea et *cinerea*, Brehm, Vögel Deutschl. pp. 403, 405 (1831).

Saxicola œnanthoides, Vigors, Zool. Blossom, p. 19 (1839).

Vitiflora œnanthe et *major*, Brehm, Vogelfang, p. 224 (1855).

Saxicola leucorhoa, Hartl. Ornith. W. Afr. p. 64. no. 192 (1857).

Adult male in breeding-plumage. Upper parts to the rump ashy grey; forehead and superciliary line pure white; a line through the eye from the lores to the ear-coverts jet-black; wings blackish brown; central rectrices black, basal third white, remaining rectrices white, broadly tipped with black; rump and upper tail-coverts pure white; underparts white to buff, often distinctly rufous on the throat and lower tail-coverts; under wing-coverts and axillaries mixed black and white. Culmen 0·75, wing 3·8, tail 2·35, tarsus 1·1.

Male in winter plumage. Upper parts more or less brown; the eye-stripe less distinct; lower parts more rufous than in the summer plumage; secondaries and wing-coverts broadly edged with rufous.

Young males resemble the female.

Adult female in breeding-plumage. Upper parts dull brown; wings hair-brown; tail as in the male, except that the terminal portion is brownish, not black; underparts light reddish brown, darkest on the breast, and becoming whitish on the abdomen and under tail-coverts.

Adult female in winter. Similar to the above, but with the secondaries and wing-coverts broadly edged with rufous.

Hab. Europe generally; Persia, Syria, Arabia, and Turkestan, Africa north of the equator, Greenland, and Eastern North America; Behring's Straits.

2. SAXICOLA STAPAZINA.

Red or Russet-coloured Wheatear, Edw. Nat. Hist. p. 31, pl. 31 (1743, partim).

Ficedula vitiflora rufescens, Briss. Orn. iii. p. 457. no. 36, pl. 25. fig. 4 (1760).

Ficedula vitiflora rufa, Briss. *tom. cit.* p. 459. no. 37 (1760, partim).

Motacilla stapazina, Linn. Syst. Nat. p. 331. no. 14 (1766, ex Edw.).

Vitiflora rufa, Steph. Gen. Zool. x. p. 569 (1817).

Œnanthe albicollis, Vieill. Nouv. Dict. xxi. p. 424 (1818).

Saxicola aurita, Temm. M. d'Orn. i. p. 241 (1820).

Sylvia rufescens, Savi, Orn. Tosc. i. p. 223 (1827).

Saxicola amphileuca, Ehr. Symb. Phys. fol. *bb* (1829).

Saxicola aurita, var. *libyca*, Ehr. *tom. cit.* pl. *aa* (1829).

Vitiflora assimilis, C. L. Brehm, *tom. cit.* p. 224. no. 7 (1850).

Adult male in breeding-plumage. A narrow frontal line, lores, region round the eye, auricular space, including a large patch on the side of the neck, wings, scapulars, and wing-coverts jet-black;

crown, neck, back, rump, and upper tail-coverts, throat, and entire underparts white, faintly clouded with pale rufous on the breast and back; central tail-feathers white on the basal third, otherwise jet-black, the outermost feathers half white; remaining rectrices white, very broadly tipped with black; under wing-coverts black; legs and bill black; iris brown. Culmen 0·62, wing 3·5, tail 2·65, tarsus 1.

Adult male in winter. Differs from the specimen last described in having the centre of the crown, nape, and back rich pale creamy rufous to rufous brown, the breast being of the same colour, but somewhat paler, and the entire underparts being washed with a rufescent tinge.

Adult female in summer. Differs from the male in having the crown, nape, and back dull brownish grey, the patch on the side of the head and wings much duller, being brownish black, not black; upper wing-coverts slightly tipped with rufous; underparts white, marked with rufous on the breast.

As is the case with all the Chats of this group, the present species often has the white on the back and breast obscured or replaced by a rich rufescent cream-tinge, which appears to form its winter livery, and in all plumages there is some slight trace of this colour either on the back or the breast.

Hab. Southern Europe, Asia Minor, Persia, and northern Africa.

There is no doubt that this is the bird described by Linnæus as *S. stapazina*, although that name has been generally applied to *S. rufa*. The description in the 'Systema Naturæ' is the following:—"*M.* ferruginea, area oculorum alis caudaque fuscis," which can only apply to the present species. The first reference is to Edwards's plate, on which both forms are figured.

3. SAXICOLA VITTATA.

Saxicola vittata, Ehrenb. Symb. Phys. fol. *cc* (1829) (type examined).

Saxicola leucolæma, Antinori & Salvadori, Att. R. Accad. Sci. Tor. viii. p. 32 (1872).

Saxicola melanogenys, Severtz. Turk. Jevotn. p. 120 (1873).

Saxicola melanotis, Sev. *tom. cit.* pl. viii. figs. 5, 6.

Saxicola leucolæma, Salvad. & Ant. Annal. Mus. Civ. Genova, iv. p. 101, tab. ii. (1873).

Adult. Crown, nape, and upper part of back greyish white; back and wings black; rump and upper tail-coverts white; quills brownish black, secondaries and larger wing-coverts slightly tipped with dirty white; central rectrices white on the basal third, otherwise black, remaining rectrices white, terminated with black, on the outermost pair this colour extends on the outer web along the terminal half; lores and a broad band passing through the eye and joining the base of the wing jet-black; chin, throat, and underparts generally pure white. Culmen 0·7, wing 3·9, tail 2·55, tarsus 0·7. Sex undetermined.

The above is the description of the type specimen in the Berlin

Museum, obtained by Hemprich and Ehrenberg at Moileh in Arabia, this being the only specimen we have examined. According to Severtzoff, the female resembles the female of *S. morio*, but has a white throat.

Hab. Bogos, Northern Abyssinia; Arabia; Turkestan.

4. Saxicola rufa.

Red or Russet-coloured Wheatear, Edw. Nat. Hist. p. 31, pl. 31 (1743), partim.

Ficedula vitiflora rufa, Briss. Orn. iii. p. 459. no. 37 (1760), partim.

Sylvia stapazina, Lath. Ind. Orn. ii. p. 530. no. 80 (1790, partim, nec Linn.).

Œnanthe stapazina (L.), Vieill. Nouv. Dict. xxi. p. 428 (1818, nec Linn.).

Saxicola stapazina (L.), Temm. Man. d'Orn. i. p. 239 (1820, nec Linn.).

Vitiflora rufa, C. L. Brehm, Vög. Deutschl. p. 406 (1831).

Vitiflora stapazina (L.), C. L. Brehm, Vogelfang, p. 224 (1850, nec Linn.).

? *Vitiflora paradoxa*, C. L. Brehm, *ut suprà* (1850).

Adult male in summer. Crown, back, rump, and upper tail-coverts, basal portion of tail, breast, and abdomen white, remainder of the plumage black; crown marked with grey; back and breast slightly washed with rufous cream-colour; the black on the throat does not extend nearly so far down as in *S. melanoleuca*; secondaries slightly tipped with dirty white; central rectrices black, except at the base, where they are white; remainder white, broadly terminated with black, this colour extending on the outermost along the outer web and obliquely across the inner web nearly to the centre of the feather; beak and legs black; iris brown. Culmen 0·68, wing 3·65, tail 2·6, tarsus 0·95.

Adult male in winter. The upper parts are pale ferruginous, often with a brownish tinge on the head; the breast the same but lighter; abdomen and under tail-coverts washed with dull rufous; there are rufous edges to the wing-coverts and secondaries, and the quills are brownish; the black of the throat is partly obscured by white edgings to the feathers.

Adult female in breeding-plumage. Upper parts to the rump earthy brown; rump and upper tail-coverts white; tail as in the male; quills dark brown; throat with the ear-coverts blackish, the feathers with pale edges; remainder of lower parts white, with a rufous tinge, which is more marked on the breast.

Adult female in autumn. Upper parts to the rump dull rufous; the secondaries and wing-coverts with rufous margins; lower parts pale dull rufous, deepest on the breast; throat-feathers black at the base, the feathers edged with whitish.

It is highly probable that old females of this species resemble the male; but the series at our disposal does not enable us to determine this with certainty. The same remark applies to several other species, especially *S. melanoleuca*, *erythræa*, and *deserti*.

Hab. South-western Europe, including Italy and north-western Africa. It is occasionally found in Germany, and occurs as a straggler in Egypt and the Levant.

5. SAXICOLA MELANOLEUCA.

Muscicapa melanoleuca, Güld. Nov. Com. Petr. xix. p. 468, pl. 15 (1775).

Saxicola xanthomelæna, Ehr. Symb. Phys. fol. *aa* (1829).

Saxicola eurymelæna, Ehr. *tom. cit.* fol. *bb* (1829).

Saxicola albicilla, V. Müll. Naumannia, 1851, iv. p. 28.

Saxicola hendersoni, Hume, Ibis, 1871, p. 480.

Saxicola talas, Severtzoff, Turkest. Jevotn. p. 119, pl. viii. figs. 1, 3, 4 (1873).

In plumage this species passes through the same changes as its close ally *S. rufa*, and only differs from that bird in having the black on the throat extended much further down; and as a rule the males have the white portions of the plumage much purer. In many old males the feathers on the crown and sometimes on the back are considerably worn, the blackish grey basal portion showing very distinctly.

Hab. South-eastern Europe as far west as Malta; North-eastern Africa; Asia Minor, Persia, and Yarkand.

6. SAXICOLA ERYTHRÆA.

Saxicola erythræa, Ehr. Symb. Phys. fol. *cc* (1829).

Saxicola halophila, Trist. Ibis, 1859, p. 59.

Saxicola libanotica, Trist. Ibis, 1867, pp. 91–94, nec Ehr.

Saxicola finschii, Heugl. Orn. N.O.-Afr. p. 350. no. 299 (1869).

Adult male. Crown, nape, dorsal region, rump, and upper tail-coverts, lower breast, abdomen, and under tail-coverts pure white; sides of the head and neck, throat and upper part of the breast, wings, scapulars, wing-coverts and wing-lining black; quills brownish black; secondaries slightly tipped with dull white; central tail-feathers white on the basal half and black on the terminal portion: other rectrices white, broadly terminated with black, and finally very narrowly tipped with dirty white; bill and legs black; iris dark brown. Culmen 0·7, wing 3·4, tail 2·35, tarsus 1·05.

Young male. Crown, nape, back, and scapulars white, obscured by dull isabelline; wings as in the adult female; tail, throat, and underparts generally as in the adult male.

Adult female. Crown, back, and scapulars dull brownish grey or dust-colour; rump and upper tail-coverts white; quills blackish brown, narrowly margined with dull fulvous; wing-coverts similar, but blacker; tail as in the adult male, but rather duller in colour; superciliary region lighter than the rest of the head; throat, sides of the neck, and auriculars black, considerably obscured by light dusty brown and dirty white edges; rest of the underparts white; under wing-coverts black; legs and bill black; iris brown.

Young female. Similar to the adult female, except that the upper parts are paler in colour, and that the throat is not blackish.

Hab. Algeria, Egypt, Palestine, Syria, Arabia, and Persia.

7. SAXICOLA MŒSTA.

Saxicola mœsta, Licht. Verz. Doubl. p. 33 (1823) (type examined).

Saxicola philothamna, Tristr. Ibis, 1859, p. 58 (type examined).

Adult male (summer). Crown and nape white, washed on the former with dirty grey; back black; rump and upper tail-coverts rufescent white; outer rectrices bright rufous at the base, terminal half blackish brown; quills dull brown, with paler margins; lores, throat, sides of the head, and neck jet-black; breast and abdomen white; under tail-coverts pale rufous. Culmen 0·8, wing 3·8, tail 2·9, tarsus 1·2.

Adult female (November). Upper parts sandy isabelline, darker on the back; quills dark brown, with isabelline margins; tail blackish brown, basal half of outer rectrices bright rufous; tail-coverts, both upper and under, pale rufous; underparts buffy white.

In winter the general colour of the plumage is duller and greyer, the head and nape of the male being dull brownish grey.

Hab. Algeria, Egypt.

8. SAXICOLA XANTHOPRYMNA.

Saxicola xanthoprymna, Ehr. Symb. Phys. fol. *dd.* (1829).

Saxicola erythropygia, Taylor, Ibis, 1867, p. 61

Saxicola mœsta, Sharpe & Dresser, B. of Eur. part 16, Feb. 1873, nec Licht.

Adult male. Crown, nape, back, and wing-coverts dark brownish grey; forehead and a broad superciliary line extending to the nape white; wings greyish brown, narrowly tipped with dirty white; lower part of back, rump, and upper tail-coverts bright rufous; tail white at the base and to one third of its length on the central, increasing to about two thirds on the outer rectrices, remainder blackish, tipped with white; throat, sides of the face, and neck black; underparts dull white, washed with rufous on the flanks; under wing-coverts black; under tail-coverts rufous. Total length 6·2 inches, culmen 0·6, wing 3·7, tail 2·7, tarsus 0·95.

Female or young male. Much duller and paler in colour than the male, the eye-streak duller; throat with whitish edges to the feathers, the black basal portions showing through here and there; underparts smoky white; rump, upper and under tail-coverts dull orange-red.

Hab. N.E. Africa; Arabia Petræa.

Scarcely any Chat is so little known as the present species; and we only know of three specimens existing in Europe, two of which are in England, the third being the type in the Berlin Museum. When part xvi. of the 'Birds of Europe' was published, it was believed that *S. mœsta*, Licht., was identical with this species; and only when we visited the Berlin Museum, taking with us Canon Tristram's and many other types, did we discover that this was not the case. We then likewise ascertained that Hemprich and Ehrenberg's specimen of *S. xanthoprymna* is merely a young bird of this species, which therefore will bear their name.

9. SAXICOLA DESERTI.

Saxicola stapazina, Licht. in Eversm. Reise nach Buchara, p. 128. no 12 (1823), nec Linn.

Saxicola deserti, Rüpp. in Temm. Pl. Col. pl. 359. fig. 2 (1825) (type examined).

Saxicola isabellina, Temm. *tom. cit.* pl. 472. fig. 1 (1829).

Saxicola pallida, Rüpp. Neue Wirbelth. p. 80 (1835–40), nec Atlas, pl. 34. fig. *a* (type examined).

Saxicola atrogularis, Blyth, Journ. As. Soc. Beng. xvi. p. 130 (1847).

Saxicola salina, Eversm. Bull. Soc. Mosc. xxiii. pt. ii. p. 567, pl. 8. fig. 2 (1850).

Saxicola atrigularis, Bp. Consp. Gen. Av. i. p. 304 (1850).

Saxicola gutturalis, Licht. Nomencl. Av. p. 35 (1854) (type examined).

Saxicola homochroa, Tristr. Ibis, 1859, p. 59 (type examined).

Saxicola montana, Gould, B. of Asia, pt. xvii. (1865).

Saxicola atrogularis, id. *l. c.*

Saxicola albomarginata, Salvad. Att. Soc. Tor. 1870, p. 507 (type examined).

Adult male in breeding-plumage (Algerian Sahara). Crown, nape, and back sandy isabelline, the crown tinged with grey; rump, with the upper tail-coverts, pure white; quills black, narrowly margined with whitish; inner secondaries brownish black, broadly margined with sandy isabelline; scapulars and larger wing-coverts pale isabelline; median and lesser coverts black, narrowly tipped with white; tail black, white at the base; sides of the head and neck, and entire throat to the breast glossy black; forehead and a superciliary line dull white; breast and abdomen white, on the breast and flanks washed with pale rufous isabelline; under wing-coverts white; axillaries black, tipped with white. Total length 5·25 inches, culmen 0·75, wing 3·5, tail 2·6, tarsus 1·1.

Adult male in winter (Egypt). Differs from the specimen last described in being rather greyer on the back, the black on the throat being somewhat obscured by creamy white margins to all the feathers; and the light margins and tips on the wing-feathers are much more fully developed.

Adult female (Etawah, N.W. India, 19th Jan.). The upper parts are duller and greyer than in the male; the white frontal line and supercilium are scarcely visible; the rump and upper tail-coverts are washed with rufous isabelline; and the black throat is absent, the entire underparts being sandy isabelline, rather greyer on the neck; wings dull dark brown, tail as in the male.

Saxicola isabellina, Temm. nec Rüpp., *S. pallida*, Rüpp., and *S. homochroa*, Tristr. *l. c.*, are all females of this species; the remaining names apply to the male. *S. pallida*, Rüpp. Atlas, pl. 34. fig. *a*, is the female of *S. monacha*, q. v.

Hab. South-eastern Russia; Southern and Central Asia as far east as Central India and Yarkand; Northern and North-eastern Africa.

10. SAXICOLA LEUCOMELA.

Motacilla leucomela, Pall. Nov. Com. Petr. xiv. p. 584. no. 6, pl. 22. fig. 3 (1770).

Muscicapa leucomela, Lath. Ind. Orn. i. p. 469. no. 7 (1790).

Sylvia leucomela (Pall.), Temm. Man. d'Orn. p. 138 (1815).

Œnanthe pleschanka, Vieill. N. Dict. xxi. p. 423 (1818).

Saxicola leucomela (Pall.), Temm. Man. d'Orn. i. p. 243 (1820).

Saxicola lugens, Licht. Verz. Doubl. p. 33 (1823) (type examined).

Vitiflora leucomela (Pall.), Bp. Comp. List B. of Eur. & N. Am. p. 16 (1838).

Saxicola atricollis, v. Müll. Naumannia, 1851, iv. p. 28, "Abyssinia."

? *Saxicola capistrata*, Gould, B. of Asia, part xvii. (ptil. hiem.), 1865.

Adult male (Egypt). Crown and nape white, the former strongly tinged with brownish grey; back, scapulars, throat to the upper part of the breast, sides of the head and neck, including a narrow line above the eye, upper part of the flanks, under wing-coverts, and axillaries glossy jet-black; wings duller black than the back, secondaries narrowly tipped with whitish; rump and upper tail-coverts pure white; tail as in *S. morio*, but narrowly tipped with white; breast and abdomen pure white; crissum and under tail-coverts pale rufous; bill and legs black; iris dark brown. Culmen 0·7, wing 3·8, tail 2·75, tarsus 1·05.

Female. Similar to the male.

Hab. Southern and South-eastern Europe, Northern Africa, and Western Asia as far east as Persia.

11. SAXICOLA MORIO.

Saxicola morio, Ehr. Symb. Phys. fol. *aa*, "Egypt and Arabia" (1829).

Saxicola leucomela, Gould, B. of Asia, part xviii. (1865).

Saxicola leucomela, Jerd. B. of I. ii. p. 131 (1863, nec Pall.).

Saxicola capistrata, Hume, Ibis, 1868, p. 233 (nec Gould).

Adult male (Lahore). Crown and nape greyish white, with the faintest wash of brown; mantle, throat, and upper part of the breast, including the throat and sides of the face and the feathers immediately over the eye, jet-black; quills dark hair-brown; terminal half of central and the tips of the outer tail-feathers blackish brown; rump, upper and under tail-coverts, lower part of the breast, and abdomen white; under wing-coverts black; under surface of wing dull sooty. Culmen 0·65, wing 3·6, tail 2·65, tarsus 1.

The under tail-coverts in some specimens are tinged with rufous.

Female. Probably similar to the male, but browner on the back. But little is as yet known respecting the changes of plumage due to age and sex in this or the preceding species.

The present species appears as a rule to have the crown much greyer than is the case with *S. leucomela*; and the crissum is almost always white: the chief and most constant characteristic, however, is the colour of the inner webs of the primaries, which is black or blackish, generally the former; but in one or two specimens it is dull, smoky, blackish grey, while in *Saxicola leucomela* the inner webs of the primaries are invariably white. One single specimen of *S. morio*, from Lahore, in Dresser's collection, has the under tail-coverts faintly washed with rufous, but the inner webs of the primaries are very distinctly smoky black. All the rest of the specimens have the crissum and under tail-coverts white. A specimen from Mongolia, in Canon Tristram's collection, has the quills dull brownish and the feathers on the back edged with brown.

Mr. Hume (Ibis, 1868, p. 233) states that he has ascertained beyond doubt that this bird is the young male of *S. picata*, Blyth. He states that, out of 20 specimens collected, none were either females or old birds, that he has intermediate forms, and that females shot in company with both forms were identical. We have certainly no specimens of *S. morio* marked as females; but if *S. picata* be the adult, it is singular that no specimens of this form should have been procured by Hemprich and Ehrenberg, and also that no corresponding phase of the closely allied *S. lugens* should be known. We can only say that further evidence is necessary.

We have a male specimen of *S. morio*, shot in Persia in June, when it must have been fully adult; and the bird has been found in the same stage in Turkestan.

Hab. Eastern Europe, North-eastern Africa, and Western and Central Asia, extending to North-western India.

12. SAXICOLA ALBONIGRA.

Saxicola alboniger, Hume, Stray Feathers, i. pp. 2, 185 (1872).

Adult male (December). Head, neck, and upper parts, as far as the lower portion of the back, throat to the upper part of the breast, and axillaries jet-black; quills, central rectrices, except at the base, and tips of outer rectrices brownish black; remainder of the plumage pure white. Culmen 0·8, wing 3·8, tail 2·6, tarsus 1.

Female. Similar to the male.

Young. Differs in having the black more sooty in tinge.

Hab. South-eastern Persia, Baluchistan, Sind.

13. SAXICOLA PICATA.

Saxicola picata, Blyth, J. A. S. Bengal, xvi. p. 131 (1847).

Dromolæa picata (Bl.), Gould, B. of Asia, part xvii. (1865).

Adult male. Similar to *S. alboniger*, except that it is smaller, and the black extends further down on the lower back. In some specimens the outer rectrices are almost pure white. Culmen 0·75, wing 3·5, tail 2·55, tarsus 1.

Adult female. Upper parts to the rump, wings, central rectrices, except at the base, and tips of the outer rectrices hair-brown; ear-coverts with a slight tinge of rufous; throat pale greyish brown; breast very pale brownish white, passing into white on the abdomen. Culmen 0·73, wing 3·25, tail 2·25, tarsus 0·98.

According to Hume, *Saxicola morio* (*capistrata*, Gould, apud Hume) is the young male of this species (see *S. morio*).

Hab. Persia, Baluchistan, N.W. India.

14. SAXICOLA MONACHA.

Saxicola monacha, Rüpp. in Temm. Nouv. Rec. Pl. Col. pl. 359. fig. 1 (1825).

Saxicola pallida, Rüpp. Atlas, Taf. 34 (1826) (type examined).

Saxicola pallida, id. Neue Wirbelth. p. 80, av. hornot. (1835–40).

Saxicola gracilis, Licht. Nomencl. Av. p. 54 (1854) (type examined).

Adult male. Crown, including the upper part of the orbital region, nape, rump, upper tail-coverts, and lower parts from the breast pure white; mantle, wings, throat, sides of neck, and breast jet-black; central rectrices with the terminal half to two thirds dark brown; basal portion and the whole of the outer rectrices pure white, except that on some of the outer rectrices there are occasional brown spots towards the tip. Culmen 0·92, wing 4·1, tail 3·2, tarsus 0·95.

Adult female. Upper parts to the rump hair-brown; quills and terminal portion of central rectrices rather darker brown; rump, upper tail-coverts, and tail, except as above, pale yellowish rufescent, often, as in the male, with brown spots on the terminal portion of the outer rectrices; underparts isabelline white.

Hab. North-eastern Africa, Palestine, and Baluchistan; probably also throughout South-western Asia, in the desert region.

Obs. We have examined the types of *S. monacha* and *S. pallida* in the Frankfort Museum, and of *S. gracilis* in the Berlin Museum. The type of *S. pallida*, figured and described in Rüppell's 'Atlas,' is a female of the present species. In the 'Neue Wirbelthiere' Rüppell refers to this figure as that of an immature bird, and adds that the adult of *S. pallida* is the bird figured by Temminck (Pl. Col. pl. 472. fig. 1) under the name of *S. isabellina*. This figure, however, represents a female of *S. deserti*; and two specimens, both apparently females of *S. deserti*, are in the Frankfort Museum labelled as the female and young of *S. pallida*. From the above it will be seen that we agree with Ehrenberg and Von Heuglin's identification of *S. pal-*

tida. Dr. Finsch, who looked on S. *pallida* as a distinct spec
not the opportunity of examining so large a series of *S. mon*
we have been able to compare.

15. Saxicola leucopyga.

Saxicola leucura (Gm.), Licht. Verz. Doubl. p. 32 (18
Gm.

Vitiflora leucopyga, C. L. Brehm, Vogelf. p. 225 (1855).

Vitiflora leucura, C. L. Brehm, *ut supra* (1855), partim

Saxicola leucocephala, Paul v. Württ., *fide* C. L. Brehm,
(1855).

Dromolaea leucocephala, A. E. Brehm, Journ. f. Orn. 185

Dromolaea leucopygia, A. E. Brehm, *tom. cit.* p. 66.

Dromolaea leucopyga, Br., Tristram, Ibis, 1859, p. 297.

Dromolaea monacha, Loche, Exp. Scient. de l'Alg. i. p. 199
nec Rüpp.

Dromolaea nigra, Loche, *tom. cit.* p. 200 (1867).

? *Saxicola leucuroides*, Heuglin, Orn. N.O.-Afr. p. 358.
(1869).

? *Saxicola speculifera*, Heuglin, *tom. cit.* p. 358. no. 309 (1

Saxicola cursoria, Savig. Desc. de l'Ég. xxiii. p. 347, pl.
(nec Vieill.), *fide* Heugl. *ut supra* (1869).

Adult male (Nubia). Crown, nape, rump, upper and un
coverts, anal region, and all the rectrices except the two cent
white; rest of the body above and below, including the
above the eye, glossy jet-black; terminal half of the cent
feathers and two thirds of their shafts black, remainder
There are occasionally a few black spots on the tips of th
rectrices. Culmen 0·82, wing 4·1, tail 2·9, tarsus 1·1.

Female. Similar to the male.

Young birds have the crown of the head black.

Hab. Northern Africa and Palestine.

Obs. The "Traquet coureur ou Traquet à calotte et queue bl
of Levaillant (pl. 190), *Œnanthe cursoria*, Vieill. (N. D
p. 431), might possibly be this species; but Levaillant, in h
figures it with the rump and upper tail-coverts jet-black, whic
us from adopting the name*.

16. Saxicola leucura.

White-tailed Thrush, Lath. Syn. iii. p. 49, "Gibraltar" (

Turdus leucurus, Gm. Syst. Nat. i. p. 820 (1788, ex Lath.)

Œnanthe leucura, Vieill. Nouv. Dict. xxi. p. 422, "Spain, S
France" (1818).

Saxicola cachinnans, Temm. Man. d'Orn. i. p. 236, "S
Europe" (1820).

Dromolaea leucura, Cab. Mus. Heinearium, i. p. 9 (1850)

Vitiflora leucurus, C. L. Brehm, Vogelf. p. 225, "N.E. A
S. Europe" (1855), partim.

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* Compare Sundevall, "Om Levaillant's Ois. d'Afr.," Kong. Sv. V
Handl. ii. no. 3, p. 45.

Adult male (Algeria). Entire head and body black, excepting the upper and under tail-coverts, which are pure white; wings brownish black; terminal half of the central rectrices and tips of remaining rectrices black; rest of the tail white. Culmen 0·91, wing 3·66, tail 2·92, tarsus 1·08.

Female. Much duller in colour than the male, being dull brownish black, instead of black.

Hab. Southern Europe and North-western Africa.

17. SAXICOLA OPISTHOLEUCA.

Saxicola leucura, Blyth, J. As. Soc. Beng. xvi. p. 131 (nec Gm.).

Saxicola opistholeuca, Strickl. Jard. Contr. to Orn. (1849) p. 60. n. 10.

Saxicola leucuroides, Jerdon, Birds of India, vol. ii. p. 130 (nec Guér.).

Dromolæa opistholeuca (Str.), Gould, B. of Asia, part xvii. ♂ only (1865).

Adult male. Head and body glossy black, except the rump, upper and lower tail-coverts, and lower part of the abdomen, which are pure white; wings blackish brown, lighter on the inner webs, central rectrices white on the basal third, the rest black, remaining tail-feathers white, broadly terminated with black. Culmen 0·6, wing 3·65, tail 2·8, tarsus 0·9.

Female. Sooty black wherever the male is pure black.

Hab. North-western India.

18. SAXICOLA ISABELLINA.

? *Motacilla strapazina,* Pall. Zool. Ros.-As. i. p. 474, nec *stapazina,* Linn. (1811).

Saxicola isabellina, Rüpp. Atlas, p. 52, t. 34 *b* (1826), type examined.

Saxicola saltator, Ménétr. Cat. Rais. p. 30 (1832).

Saxicola saltatrix (Mén.), Keys. et Blas. Wirbelth. Europ. pp. lix et 192 (1840).

Saxicola œnanthe β, id.

Saxicola squalida, Evers. Add. ad Zool. p. 16 (1842).

Saxicola valida, Licht. Nomencl. p. 35, *nomen nudum* (1854), type examined.

Saxicola opistholeuca ♀ (nec ♂), Gould, Birds of Asia, part xvii.

Saxicola œnanthe, Jerdon, B. of India, ii. p. 132 (1863), nec Linn.

Adult male. Upper parts to the rump dull greyish isabelline or sandy brown, a white superciliary stripe from the base of the bill, extending back over the ear-coverts; lores black; ear-coverts brown; narrow space on the rump and upper tail-coverts white; basal portion of all rectrices white, tips black; the latter colour extending over half or rather more of the central rectrices and about one third of the remainder; quills brown, the tips rather darker; edges and tips of the secondaries pale; lower parts isabelline, whitish on the chin and darkest on the breast; wing-lining white; bill and legs black. Wing 3·95, tail 2·45, tarsus 1·18, culmen 0·6.

Adult female only differs in having the black on the lores less distinct. In winter the colours are a trifle duller, and the pale edgings on the wing-coverts and secondaries broader.

Hab. South-eastern Europe; Eastern and North-eastern Africa, and Western Asia as far east as North-western India.

19. SAXICOLA CHRYSOPYGIA.

Saxicola chrysopygia, De Filippi, Ann. Zool. Genova, ii. p. 381 (1863).

Saxicola kingi, Hume, Ibis, 1871, p. 29.

Adult. Upper parts to the rump greyish earthy brown; lores dark grey; a greyish white superciliary line from the nostril over the eye; ear-coverts rufescent brown; rump and upper tail-coverts pale rufous; base of tail-feathers bright ferruginous; terminal portion (about one half of the central and one fourth of the remaining rectrices) dark brown; quills very little darker than the back. Young birds (and adults in winter plumage?) have broad rufescent margins to the secondaries and wing-coverts, and pale rufescent tips to the quills and rectrices; chin and upper throat greyish white; breast brownish grey; abdomen paler and more rufescent; lower tail-coverts buff; under wing-coverts and axillaries white; iris dark brown; bill and legs white. Wing 3·5, tail 2·25, tarsus 1·02, culmen 0·7. Sexes alike.

Hab. Persia; Baluchistan; North-western India.

There can, we think, be no question that this bird is the *S. chrysopygia* of De Filippi, as it was collected by Mr. Blanford in Persia and agrees with De Filippi's description. Unfortunately no specimen was preserved by the describer. It agrees perfectly with Mr. Hume's description of *S. kingi*.

2. ÆTHIOPIAN SPECIES (non-migratory).

20. SAXICOLA BOTTÆ. (Plate XXXVI. fig. 1.)

Saxicola bottæ, Bp. Comptes Rendus, 1854, p. 7 (type examined).

Saxicola ferruginea, Heugl. Syst. Uebers. no. 234 (*descript. nulla*).

Saxicola frenata, Heugl. Jour. f. Ornith. 1869, p. 158.

Upper parts to the rump dull brown; a black line through the eye from the lores to the ear-coverts; narrow line above lores, upper tail-coverts, and basal portion of rectrices white; terminal half of outer tail-feathers, and a much larger proportion of the central ones, black; quills dark brown; chin and throat white; breast dull ferruginous; abdomen and lower tail-coverts the same but paler. Wing 3·75, tail 2·35, tarsus 1·2, culmen 0·63. Sexes alike.

Hab. Highlands of Abyssinia; Sennaar, Nubia?

21. SAXICOLA HEUGLINI. (Plate XXXVI. fig. 2.)

Saxicola intermedia, Heugl. Syst. Uebers. p. 26. no. 239 (1855), *desc. nulla*.

Saxicola leucorhoides, Heugl. J. f. O. 1862, p. 291 (nec Guér.), *desc. nulla*.

Saxicola heuglini, Finsch & Hartl. Vög. N.O.-Afr. p. 259 (1870) (type examined).

Type. Upper parts dull dark blackish brown, some of the feathers on the back margined with dull rufous; quills narrowly tipped, secondaries and wing-coverts broadly margined and tipped with dull rufous; central rectrices black, except at the base, where they are white; rest of tail-feathers white on the basal and black on the terminal half, narrowly tipped with white; underparts white on the breast, lower part of the throat, flanks, and under tail-coverts washed with bright rufous; upper tail-coverts white; over the eye an indistinct whitish line. Wing 3·35, tail 2·45, tarsus 1·05, culm. 0·52.

Hab. Highlands of Abyssinia.

22. Saxicola lugubris.

Saxicola lugubris, Rüpp. Neue Wirbelth. p. 77, pl. 28. fig. 1 (1840) (type examined).

Saxicola brehmii, Salvad. Att. Ac. Tor. 1870, p. 508 (type examined).

? *Saxicola leucuroides*, Guér. Rev. Zool. 1843, p. 162.

Adult male. Crown and nape brownish grey, feathers with black shafts; rump and upper tail-coverts and basal portion of all the rectrices rufous, amounting to about half the length of the central and two thirds of the remaining rectrices; centre of abdomen whitish; under tail-coverts buff; rest of plumage jet-black. Culm. 0·7, wing 3·3, tail 2·4, tarsus 0·9.

Adult female. Is said not to differ from the male in plumage, but is slightly smaller (*fide* Von Heuglin).

The head is very much darker in some specimens than in others, being sometimes scarcely paler than the back; and in one skin thus coloured there is no white on the abdomen. Such a specimen, we think, must have been the type of *S. leucuroides*, which has hitherto always been identified with *S. opistholeuca*, Strickland (q. v.). But Guérin's description of *S. leucuroides* runs thus :—"Tota atra, cauda basi uropygioque imo rufescenti-albidis." Now the tail is, so far as we know, never rufescent at the base in *S. opistholeuca*; and that species, moreover, has not been found by any observer in Abyssinia, whence the bird described by Guérin was brought by Ferret and Galinier. No type of Guérin's species exists in the Paris Museum.

The base of the tail-feathers is occasionally white; and this is the form described by Salvadori under the name of *S. brehmii*.

Hab. Abyssinian highlands.

23. Saxicola atmori.

Saxicola atmorii, Tristram, Ibis, 1869, p. 206.

Type. Head and body above and below smoky black, upper tail-coverts white; central rectrices black, outer rectrices white, tipped with black, which extends to some distance up the outer web of the outer feather on each side. Nothing is known of the sexual differences in this species.

Hab. Damara Land, South Africa.

24. SAXICOLA MONTICOLA.

Le Traquet montagnard, Levaill. Ois. d'Afr. iv. p. 105, pl. 184. fig. 2 (1805).

Œnanthe monticola, Vieill. N. Dict. xxi. p. 434 (1818, ex Levaill.).

Vitiflora rupicola, Boie, Isis, 1828, p. 320.

Grillivora capensis, Swains. Classif. of B. ii. p. 238 (1837).

Dromolæa æquatorialis, Hartl. Journ. f. O. 1861, p. 112.

Dromolæa monticola, Bocage, Jorn. Sc. Lisb. 1867, p. 151.

Adult male. Shoulders, rump, abdomen, lower breast, upper tail-coverts, and the basal portion of all rectrices, except the central pair, white; a narrow streak from the base of the bill to above the eye grey, or mixed white and black; remainder of plumage black. The quills and greater coverts are brownish black, and the thigh-coverts the same; and some black is mixed with the white of the under tail-coverts. On the pair of rectrices next to the central pair the white extends about halfway from the base; on the other rectrices only the tip is black, but this colour extends on the outermost pair some distance up the outer web. Culmen 0·9, wing 4·25, tail 2·85, tarsus 1·25.

In some specimens the second and third rectrices on each side are entirely white, and the least wing-coverts nearest to the carpal joint are black with white edges. In younger specimens the abdomen is mixed white and black.

? *Female.* Very dark brown throughout, except the rump, lower abdomen, tail-coverts, and basal portion of outer tail-feathers, which are white, the under tail-coverts mixed white and brown, and the distribution of white on the tail-feathers as in the male. Culmen 0·85, wing 4·35, tail 2·95, tarsus 1·25. In some specimens, probably younger birds, the whole abdomen is brown.

Hab. South Africa.

We think it highly probable that the bird last described may be the female of *S. monticola.* That it is a female we know, because we have seen two specimens carefully sexed by the late Mr. Anderson, and one by Mr. F. Buckley; but we require much additional information as to the phases of plumage of South-African Stone-Chats.

Obs. We have examined specimens which agree fairly with Levaillant's figure above quoted, upon which Vieillot's species was founded. Levaillant figures on the next plate (185) two birds as immature specimens of this species. These we identify with *S. leucomelæna* (fig. 2) and *S. castor* (fig. 1); but as this plate is not referred to by Vieillot, and as we think it probable that the three figures represent three distinct species, there can be no question that the name of *S. monticola* must be retained for the present species. Of course, as we judge merely from the somewhat meagre materials at our disposal, we may be in error; but as all three forms have received distinct names, and appear to us to possess good distinctive characters, we have deemed it best to keep them separate. Mr. Layard only quotes plate 184. fig. 2 of Levaillant; but he describes the young as grey. The specimens which we have identified with *S. castor* and *S. leucomelæna* have every appearance of being fully mature birds.

25. Saxicola arnotti.

Saxicola arnotti, Tristr. Ibis, 1869, p. 206, pl. vi.

Male. Head and body jet-black, a few white feathers on the crown; forehead and supercilia white, wings blackish brown, shoulders white, tail entirely black. Bill from the gape 0·8, wing 3·9, tail 3, tarsus 1·1.

Hab. Adam Kok's New Land, S. Africa (*teste* Layard).

We have not seen a specimen of this species, and copy the above from Mr. Tristram's original description.

26. Saxicola leucomelæna. (Plate XXXVII. figs. 1 & 2.)

Saxicola leucomelana, Burchell, Travels in S. Afr. vol. i. p. 335, note (1822).

Saxicola leucomelæna, Strickland & Sclater, Jard. Contr. 1852, p. 146. no. 27.

Dromolæa albipileata, Bocage, Jorn. Sc. Lisb. 1867, p. 151.

? *Saxicola alpina*, Chapman, Travels in S. Afr. App. p. 399 (1868), *desc. nulla.*

Adult male. Head, nape, and hind neck white, with a greyish tinge; shoulders, rump, and upper tail-coverts, abdomen, and basal portion of all except the two central rectrices white; thigh-coverts and under tail-coverts mixed white and black; rest of the plumage black, glossy black on the back and breast, quills brownish black; the black on the sides of the head includes the lores and the feathers immediately above the eye. On the outer tail-feathers the white often extends quite to the tip, a black spot only being left on the outside of each web; on the outermost tail-feather the black extends much further up the web than on the next two or three. In one specimen the outer tail-feather on each side is pure white, therein agreeing with Professor Barboza du Bocage's description of *S. albipileata*. Some specimens (? winter plumage) have the head French grey, the feathers having a dark central streak; and in one, which may be immature, the whole abdomen is black. Culmen 0·9, wing 4·25, tail 2·85, tarsus 1·2.

Hab. South Africa, Damara Land.

27. Saxicola griseiceps, sp. nov. (Plate XXXVII. fig. 3.)

S. *capite nuchaque cinereis; humeris, uropygio, supracaudalibus, rectricibus externis omnibus, nisi ad apices, abdomineque albis; collo, dorso, alis, rectricibus mediis, apicibus rectricum cæterarum, loris, regione auriculari, gutture, pectoreque nigris. Culm. long.* 0·9, *alæ* 4·4, *caudæ* 2·8, *tarsi* 1·25.

Adult male. Head and nape ashy grey; shoulders, rump, upper tail-coverts, basal portion of all the outer rectrices, and abdomen white; back, wings, central rectrices, and tips of the outer rectrices, lores, ear-coverts, throat, and breast black; on the outermost tail-feathers the black extends further up the outer than the inner web; but on the third and fourth rectrices from the outside the reverse is the case; the penultimate rectrices are entirely white (and in some specimens the two outer rectrices on each side are entirely white).

In immature specimens the head is dusky, the feathers dark-shafted, the abdomen is black, with a few white edges to some of the feathers, and the lesser coverts near the carpus are mixed white and black.

In the adult birds there is a rudimentary supercilium. Culmen 0·9, wing 4·4, tail 2·8, tarsus 1·25.

Female? Upper parts to the rump dark cinereous, shoulders white, a few of the median coverts dark-shafted; quills brownish black; tail as in the male; underparts uniform cinereous.

Hab. South Africa, Colesburg, Natal, and Transvaal.

Obs. Of the above species we have examined eight specimens—five in the plumage described as that of the male, and three in that of the female. Of the former, we have two phases of plumage corresponding to precisely similar phases in the birds we have identified with *S. monticola* and *S. leucomelæna.* In one the entire abdomen is white, and in the other white and black mixed; the first we suppose to be the adult, and the other the young. We therefore do not think that the present can be the young of *S. monticola*; and some of the specimens described have certainly no appearance of immaturity. We have examined four examples of what we consider to be the male of *S. leucomelæna*—also two of what we consider to be the male of *S. monticola,* and five of the female; and the plumage is so constant in every case that we cannot but believe that we have before us three well-marked species.

2ª. SAXICOLA DILUTA, sp. nov. (Plate XXXIX. fig. 1.)

S. *capite insuper dorsoque pallide cinereis; humeris uropygio supracaudalibusque albis; rectricibus mediis nigrescenti-fuscis, cæteris albis nigro terminatis, extremis extus apicem versus plerumque nigro marginatis; remigibus nigrescenti-fuscis; lateribus capitis gastræoque perpallide cinereis; abdomine albescente, infracaudalibus ex albo cum nigro mixtis. In nonnullis exemplis vertex nuchaque pallescunt, et ad medias plumas interscapulii, tectricumque minorum alarum striæ fuscæ adsunt. Culm. long.* 0·8, *alæ* 4·1, *caudæ* 2·55, *tarsi* 1·22, *poll. Angl.*

Adult male. Upper parts to the rump pale cinereous; shoulders, rump, and upper tail-coverts white; central pair of rectrices blackish brown, outer rectrices white with black tips, the black usually running some distance up the external web of the outer pair; quills brownish black; sides of the head and underparts very pale cinereous, becoming whitish on the abdomen; under tail-coverts white and black mixed. In some specimens the head and nape are paler grey than the back, and the interscapulary feathers have dark shafts, there are also dark shafts on some of the lesser wing-coverts near the carpus.

We were at first disposed to look upon this form as the female of *S. leucomelana*; but as we have now seen three specimens marked as males in Mr. Sharpe's collection and two in the British Museum, we can but conclude that it is a distinct species.

Hab. South Africa, Damara Land.

29. SAXICOLA CINEREA.

Le Traquet tractrac, Levaill. Ois. d'Afr. pl. 184. fig. 1 (1805).

Œnanthe cinerea, Vieill. N. Dict. xxi. p. 437, 1818, ex Levaill. (nec *Œn. cinerea*, ibid. p. 418).

Motacilla tractrac, Boie, Isis, 1828, p. 320.

Saxicola levaillantii, Smith, Zool. of S. Afr. notes to pl. 28 (1849).

Adult. Upper parts to the rump brownish cinereous; wings brown, the coverts and secondaries with pale edges; lower rump and upper tail-coverts white; tail-feathers dark brown, the outer webs of all except the central pair white, the quantity increasing on the outermost feathers; lower parts pale isabelline grey; chin whitish; abdomen and under tail-coverts white; ear-coverts pale hair-brown. Culmen 0·8, wing 3·85, tail 2·6, tarsus 1·15.

Hab. South Africa.

Vieillot, it is true, used the same name *Œnanthe cinerea* in a previous page of the same work for the common Wheatear; but as both names were published at the same time, and the first in position cannot be used, it does not appear necessary to change the received nomenclature.

30. SAXICOLA POLLUX. (Plate XXXVIII. fig. 1.)

Saxicola pollux, Hartl. P. Z. S. 1865, p. 747.

Adult. Dark ashy grey; greater wing-coverts and quills dusky black; the smaller coverts with grey edgings, the larger coverts and secondaries with whitish edgings; tail-feathers black, the four outer feathers on each side with a broad white external margin, which extends to the tip of the outermost feather and diminishes gradually on the three next, till on the fourth feather from the outside it only extends over the basal half of the feather; underparts lighter grey, fading almost to white on the abdomen and lower tail-coverts; axillaries white; the first long primary deeply emarginate on the inner web at the tip. Culmen 0·75, wing 4·1, tail 2·85, tarsus 1·3.

Hab. South Africa.

The only two specimens we have examined are labelled Beaufort and Karroo.

31. SAXICOLA CASTOR. (Plate XXXVIII. fig. 2.)

Saxicola castor, Hartl. P. Z. S. 1865, p. 747.

Adult male. Upper parts dark ashy grey; rump and upper tail-coverts white; wings and four central rectrices dusky black; outer rectrices white at the base, with a black tip, which is much broader in the fourth from the outside than in the others; underparts very little paler than the back, fading a little on the abdomen; axillaries and under wing-coverts same colour as the breast; no emargination in the inner webs of primaries. Culmen 0·9, wing 4·3, tail 3·05, tarsus 1·3.

Female. Sooty brown above, rather browner below; ear-coverts hair-brown; rump and tail as in the male. This appears to be distinguished from *S. tractrac* by having the four central tail-feathers blackish brown throughout.

Hab. South Africa, Colesburg, Eland's Post.

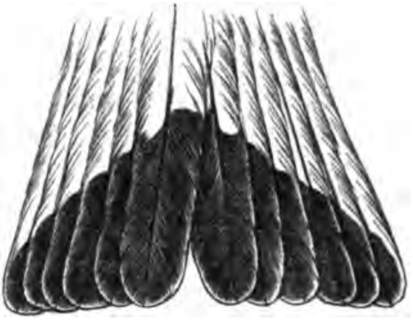
32. SAXICOLA ALBICANS.

Saxicola albicans, Wahl. Œfv. K. Vet. Ak. Förh. 1855, p. 213.

Saxicola stricklandii, Bp., Gurney in Anderss. B. of Damara Land, p. 105 (1872, nec Bp.).

Male. Upper parts to the rump greyish isabelline; rump, upper tail-coverts, and entire under surface of body white, with a faint isabelline tinge; quills dusky brown, with whitish margins and tips; secondaries much paler, with broader margins; rectrices white at the base and dusky brown on the terminal portion, with whitish tips and margins, the latter broader on the outer feathers; the dusky terminal portion extends nearly halfway up the central rectrices, but only to about one fourth of the outer ones. Culmen 0·8, wing 3·7, tail 2·05, tarsus 1·2.

Fig. 1.



Tail of *Saxicola albicans.*

Hab. Damaraland.

Obs. This species closely resembles *S. schlegeli*, but is distinguishable by being a little paler in colour, by not having the first long primary emarginate at the tip, and by having the entire basal portion of the tail white.

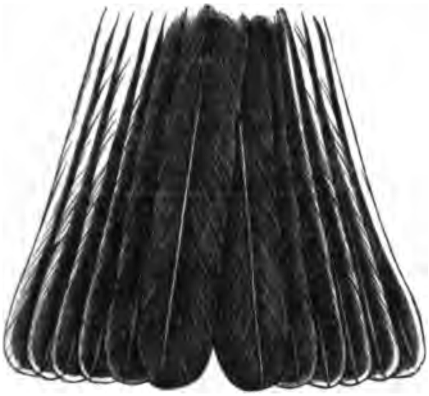
33. SAXICOLA SCHLEGELI. (Plate XXXIX. fig. 2.)

Erithacus schlegelii, Wahl. Œfv. K. Vet. Ak. Förh. 1855, p. 213.

Saxicola modesta, Tristram, Ibis, 1869, p. 206 (type examined).

Adult male. Upper parts ashy grey; rump and upper tail-coverts white; wings and tail dusky black; secondaries and wing-coverts with pale margins; the four outer rectrices with white margins extending to the tip in the outermost, and gradually diminishing till in the fourth the white does not extend over half the basal portion; underparts ashy white, fading to white on the abdomen; the first long primary deeply emarginate on the inner web. Culmen 0·8, wing 3·65, tail 2·5, tarsus 1·2.

Fig. 2.



Tail of *Saxicola schlegeli.*

Female. Precisely similar to the male, except that the first long primary is attenuated but not emarginate.

Hab. Damaraland; South Africa.

S. schlegeli, var. *minor*. This bird, of which we have two specimens, is smaller in size and paler and more sandy in colour than the specimens above described; but one example of the larger form is equally pale, and all are from the same locality. The measurements of the small variety are as follows:—culmen 0·68–0·7, wing 3·4, tail 2·3, tarsus 1·1.

34. SAXICOLA GALTONI.

Erythropygia galtoni, Strickland, Jardine's Contributions, 1852, p. 147.

Saxicola sperata, Layard, Birds of S. Africa, p. 107 (nec Lath.?).

Saxicola familiaris, Gurney, in Andersson's Birds of Damara Land, p. 103 (nec Stephens).

Upper parts to the rump hair-brown; quills the same; ear-coverts rather brighter; rump, upper tail-coverts, and basal portion of all the tail-feathers, except the central pair, ferruginous; central tail-feathers and tips of the others brown; remainder of the outer tail-feathers ferruginous, the brown colour running some distance upon the external web of the outer pair; lower parts rather paler brown than the back; chin and middle of abdomen still lighter in colour; axillaries isabelline; lower tail-coverts rufous. Culmen 0·65, wing 3·35, tail 2·35, tarsus 1.

Hab. South Africa.

Note.—This species has been identified by most modern writers with either *Saxicola sperata,* Lath., or *S. familiaris,* Stephens. We are unable to agree with either identification. *S. sperata* of Latham (Ind. Ornith. ii. p. 523) was founded on the *Traquet du Cap de Bonne-Espérance* of Buffon, Ois. vi. p. 123, described as having the upper part of the body, including the upper part of the neck and head, of a very brown green ("d'un vert très-brun"), the two central rectrices blackish brown, the two laterals marked obliquely with brown on a tawny ground, the more so as they approach the outside ("les deux latérales sont marquées obliquement de brun sur un fond fauve et d'autant plus qu'elles sont plus extérieures). This is not very intelligible; but the word "deux" may have been inserted by mistake, and it may mean that there is more brown on the outer rectrices and that the quantity diminishes gradually towards the middle, the central pair being blackish brown throughout. This description can scarcely apply to *S. galtoni,* in which the back has no green tinge and the outer rectrices are ferruginous, not tawny or fulvous.

S. familiaris, Stephens (Shaw, Gen. Zool. xiii. p. 241), was founded on *Le Traquet familier* of Levaillant's 'Oiseaux d'Afrique,' pl. 183. We quite agree with Mr. Gray in excluding this from the genus *Saxicola.* Mr. Gray refers it to *Aëdon*; and Levaillant's plate certainly agrees better with *A. leucophrys,* V., than with any Chat, the breast being represented as spotted. The description of the habits given by Levaillant may very possibly apply to *S. galtoni*; but Stephens's name can only be referred to the figure.

It will be gathered from the above that we doubt whether the bird referred to by Mr. Gurney, in the note to *S. familiaris* in Andersson's 'Birds of Damara Land,' p. 104, should be called *S. sperata.* We have seen but a single specimen of the form mentioned by Mr. Gurney, and which, as he says, is distinguished from *S. galtoni* (his *S. familiaris*) by the whitish colour of the rump. The distribution of the colours on the rectrices also appears to us different in the two forms. We consider the pale-rumped form undescribed, but we shall not apply a new name on the evidence of a single skin.

35. SAXICOLA SINUATA.

Luscinia sinuata, Sundevall, Om Levaillant's Ois. d'Afr., Kong. Sv. Vet. Akad. Hand. ii. no. 3, p. 44, note (1857).

Saxicola sinuata, Layard, Birds of South Africa, p. 106.

Adult. Upper parts dark hair-brown, rufescent towards the rump, which latter with the upper tail-coverts is rufous; quills dull black, the secondaries and coverts with pale rufous margins; tail-feathers blackish brown, the basal portion and margins very pale rufous, the amount of the latter colour increasing on the external rectrices, on the central pair only occupying the extreme base, and on the outer pair covering half of the inner and the whole of the outer web; lower parts pale ashy brown, becoming whitish on the abdomen, darker and rufous on the flanks; ear-coverts similarly coloured to the upper parts; under wing-coverts and axillaries white; the terminal portion of the first long primary is extremely narrow and slightly curved. Culmen 0·63 inch, wing 3·15, tail 1·97, tarsus 1·1.

Hab. South Africa.

36. SAXICOLA PILEATA.

Motacilla pileata, Gm. S. N. i. p. 965. no. 94, ex Lath. (1788).
Le Traquet imitateur, Levaillant, Ois. d'Af. pls. 181, 182 (1805).
Œnanthe imitatrix, Vieill. Nouv. Dict. xxi. p. 422 (1818).
Campicola livingstonii, Tristram, P. Z. S. 1867, p. 888.

Male. Forehead and superciliary stripe running back to the nape white; crown black, passing on the nape into the rufous or cinnamon-brown of the back, which becomes ferruginous towards the rump; lower rump and upper tail-coverts white; quills hair-brown, with narrow pale margins and pale tips to the secondaries; central tail-feathers black, outer feathers white on the basal half or rather more, terminal portions black; sides of the head and neck, including the lores, space under the eye, and ear-coverts, and a broad band occupying the greater portion of the breast, black; chin and throat white; abdomen rufescent white; flanks ferruginous; lower tail-coverts pale rufous. Culmen 0·8, wing 3·5, tail 2·65, tarsus 1·35.

S. livingstonii is considered a good and distinct species by Finsch and Hartlaub (Vög. Ost.-Afr. p. 251). They say that the white of the forehead and black of the crown are less extensively developed, that the pectoral band is much narrower, and the size smaller. The band across the chest is certainly less developed; but its breadth is variable in Cape specimens; and as with a series before us we can detect no other distinction, we doubt if *S. livingstonii* be worthy of separation.

Hab. South Africa generally.

37. SAXICOLA BIFASCIATA.

Saxicola bifasciata, Temm. Pl. Col. 472. fig. 2.
Saxicola spectabilis, Hartl. P. Z. S. 1865, p. 428, pl. 23.
Campicola bifasciata (Temm.), Cab. Mus. Hein. i. p. 10.
? *Le grand Motteux ou cul-blanc du Cap de B.-Espérance*, Buff. Ois. vi. p. 135 (1783).
? *Motacilla hottentotta*, Gm. Syst. Nat. i. p. 965 (1788, ex Buff.).
? *Sylvia hottentotta* (Gm.), Lath. Ind. Orn. ii. p. 531. no. 82 (1790).

Adult male. A narrow frontal line and broad supercilia extending backwards along the sides of the head yellowish buff; crown and nape blackish brown; back the same, with brown edges to the feathers; scapulars, sides of the back, and rump isabelline or yellowish buff; wing-coverts and tail black; quills blackish brown;

6. On a new Species of *Tringa* from Alaska.

By J. E. Harting, F.L.S., F.Z.S.

[Received March 26, 1874.]

(Plate XL.)

Through the kindness of Professor Spencer Baird, I received some months ago a specimen of a Sandpiper from St. Paul's Island, Alaska, with a request that I would examine and report upon it. It resembled at first sight a very large Dunlin, *Tringa alpina*, in partial summer plumage, and with the breast more or less spotted with black; but its superior size showed at once that it could not belong to that species. The only other *Tringa* at all resembling it with which I was then acquainted being *Tringa crassirostris* of Temminck and Schlegel, from China, Japan, the Malay countries, and Australia, I hastily but erroneously came to the conclusion that it should be referred to that species; and without waiting to institute any comparison of specimens, I wrote to Professor Baird accordingly. This was unfortunate; for on subsequently making a more careful examination, and comparing the bird in question with specimens in my collection of both *T. alpina* and *T. crassirostris*, I found to my surprise that it differed materially from both, being much smaller than *T. crassirostris* although considerably larger than *T. alpina*, and in several other respects, as I shall presently point out, holding an intermediate position between these two species. I have now no hesitation in saying that it may be regarded as a new and hitherto undescribed bird, and I accordingly propose to name it *Tringa gracilis*.

It may be described as follows:—

TRINGA GRACILIS, sp. nov.

T. *similis* alpinæ *sed conspicue major. Notæi plumis nigris, late rufo-marginatis; pileo fuscescente, rufo nigroque striolato; capitis et colli lateribus dilute rufescentibus, maculis minutis fuscis; uropygio nigro; gula et fronte albis; macula pectorali magna nigra; abdomine crissoque albis; tectricibus alarum pallide fuscis, albido limbatis; remigibus fuscis, scapis pure albis; subalaribus albis; rectricibus lateralibus pallide fuscis, albo-limbatis; rostro et pedibus nigricantibus.* (*Ptil. æstiv.*) *Long. tot.* 10 *poll., rostr.* 1·5, *alæ* 5·5, *tars.* 1, *dig. med. cum ung.* 1·1.

Hab. St. Paul's Island, Alaska.

The specimen from which the above description is taken was most kindly presented to me by Professor Baird, with the information that it had been obtained with several others on the island above mentioned in the month of July 1872. It is evidently in summer plumage; and being at this season black-breasted, like the Dunlin, *Tringa alpina*, we may fairly assume that in winter, like that species,

3228. *S. mœsta.*
3229. *S. castor.*
3230. *S. pollux.*
3231. *S. leucorrhoa* = *S. œnanthe.*
3232. *S. rostrata* also = *S. œnanthe.* The type of this species, which should be in the Berlin Museum, is missing there; but there are other specimens from the locality named, collected by Hemprich and Ehrenberg, which are absolutely identical with our *S. œnanthe,* though some have the beak rather stout and long.
3233. *S. leucuroides* = *S. lugubris,* 3215.
3234. *S. arnotti.*
3235. *S. atmorii.*
3236. *S. schlegelii.*
3237. *S. modesta* = *S. schlegeli,* 3236.
3238. *Campicola pileata* = *S. pileata.*
3239. *C. livingstonii* = *S. pileata.*
3240. *C. bifasciata* = *S. bifasciata.*
3241. *C. bottæ* = *S. bottæ.*
3242. *Cercomela melanura.* } We do not regard these as true
3243. *C. fusca.* } *Saxicolæ.*
3244. *C. lypura* = *C. melanura.*
3245. *C. erythræa* is not a *Cercomela,* but a true *Saxicola,* and stands as *S. erythræa.*
3246. *C. frenata* = *Saxicola bottæ.*
3247. *C. heuglini* is a *Saxicola* and not a *Cercomela.*
3248. *Dromolæa monticola* = *S. monticola.*
3249. *D. cinerea.*
3250. *D. leucura* = *S. leucura.*
3251. *D. picata* = *S. picata.*
3252. *D. monacha* = *S. monacha.*
3253. *D. leucopygia* = *S. leucopyga.*
3254. *D. leucocephala* = *S. leucopyga.*
3255. *D. opistholeuca* = *S. opistholeuca.*
3256. *D. æquatorialis* = *S. monticola,* 3248.
3257. *D. chrysopygia* = *S. chrysopygia.*
3258. *D. albipileata* = *S. leucomelæna.*
3259. *D. incompta* we have failed to identify.
3260. *D. monacha* (Loche nec Rüpp.) = *S. leucopyga.*
3261. *D. cursoria* we have failed to identify.
3262 to 3273 we do not include in the genus *Saxicola.*

it loses all trace of black upon the breast, and has the whole of the underparts pure white. The same has been ascertained to be the case with *Tringa crassirostris*.

In order to give a better idea of the size of this new Sandpiper, I subjoin the following measurements of bill, wing, tarsus, and middle toe, as compared with the same parts in the two better-known species to which it is allied:—

	Entire length. in.	Bill. in.	Wing. in.	Tars. in.	Midd. toe. in.
T. crassirostris	11	1·7	7	1·4	1·2
T. gracilis	10	1·5	5·5	1	1·1
T. alpina	8	1·4	4·5	1	0·9

In *T. crassirostris* (Plate XL. fig. 7) the bill is unusually deep at the base, and laterally much compressed; the wings long, with broad and powerful flight-feathers; the tail (fig. 9) almost square; the tibia for some portion of its length bare; the tarsus (fig. 8) longer than the middle toe; the toes comparatively short, stout, and well margined, as in *Tringa canutus**, while the nails are long and curved.

In *T. gracilis*, as in *T. alpina* (see Plate XL.), the bill (fig. 4) is more slender and less compressed at the sides; the wings, though long, have narrower and more feeble flight-feathers; the central feathers of the tail (fig. 6) are prolonged beyond the rest; the tibia is feathered nearly to the tarsal joint; and the tarsus is somewhat shorter than the middle toe and nail. The toes (fig. 5) are thus comparatively longer, and, besides being more slender, are not margined to the same extent as in *T. crassirostris*, although this feature is more noticeable in *T. gracilis* than in *T. alpina*, which may be said to be almost devoid of any emargination, while the nails are shorter and weaker.

A considerable difference is observable in the contour of the tail in these three species, as may be seen from the accompanying figures (Plate XL. figs. 3, 6, 9).

In the letter which accompanied the specimen now before me, Professor Baird likened the species to *Tringa maritima*, but remarked that he had received "specimens in which the black pectoral spot is much more distinct and better defined" [than in the specimen he sent me], "resembling somewhat that of *T. alpina*, only situated considerably further up on the breast." In some respects no doubt the bird in question does resemble *T. maritima*, as, for instance, in having the tibia more or less feathered, in having the tarsus if any thing shorter than the middle toe, and again in the contour of the tail. But it differs entirely from *T. maritima* in the character of the nuptial plumage, as also in the colour of the soft parts—the legs and toes in *T. maritima*, as also the base of the mandibles, being of a yellowish clay colour, while the same parts in *T. gracilis*, as in *T. alpina*, are black.

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* Several naturalists who have met with *T. crassirostris* for the first time, as Messrs. Hume, Swinhoe, Blakiston, and others, have likened it, from its robust size, to the Knot, *T. canutus*; and Mr. Swinhoe has named it the Chinese Knot. There can be little doubt, however, from the character of its seasonal changes of plumage, as well as from certain similarities of structure, that its affinities are with the Dunlin, *T. alpina*.

The discovery of this new species of Sandpiper will be as gratifying to ornithologists as it was unexpected, and I feel much indebted to Professor Baird for having afforded me an opportunity of bringing it to their notice. Although it has only been met with hitherto upon St. Paul's Island, Alaska, there is no reason to suppose that it has a very restricted range. On the contrary, being capable, like all its congeners, of powerful flight, I should at least expect to hear of it on the mainland on both sides of Behring Sea, and probably as far northward as the Arctic Circle.

Moreover, it is not unlikely that on the west coast of North America it may have been mistaken for *Tringa alpina*, var. *americana*, Cassin. It should be observed that in comparing the dimensions of the species above named, I have preferred to take an average specimen of *T. alpina* without reference to locality (it happens to have been obtained in England), rather than select, as I might have done, an American example, which would only differ in having the bill equal to, or slightly longer than, that of *T. gracilis*; for this long-billed variety, as I have before pointed out (P. Z. S. 1871, p. 115), is not confined to the American continent.

PS. (June 20, 1874).—Since the foregoing remarks were written, I have been in correspondence with Dr. Elliott Coues on the subject of a *Tringa* recently described by him as *Tringa ptilocnemis* in an "Appendix" to Mr. H. W. Elliott's 'Report on the Prybilov Islands.' This "Appendix" I have not yet seen, although Dr. Coues has most kindly forwarded proof-sheets of the body of the work; but I have no doubt, from his letters to me on the subject, that his bird is the species now under notice.

Dr. Coues informs me that the work referred to, although dated 1873, was not actually published until either January or February of the present year.—J. E. H.

7. On the Short-tailed Armadillo (*Muletia septemcincta*).

By Dr. J. E. GRAY, F.R.S. &c.

[Received March 12, 1874.]

(Plate XLI.)

The British Museum has received a skeleton, frontal and dorsal disk, and tail of the Short-tailed Armadillo, made from an adult specimen, which I believe was alive in the Society's Gardens *.

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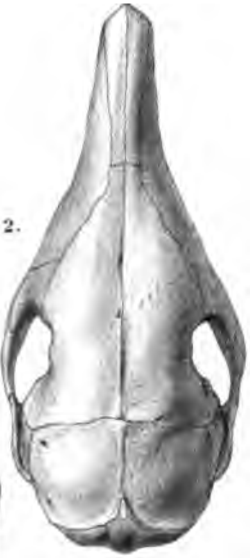
* The specimen from which the skeleton was prepared was presented to the Society by Mrs. Mackinlay, July 18th, 1873, along with another of the same species. Other examples had previously been received from the same donor. See *Tatusia hybrida*, Revised List of Vert. p. 110.—P. L. S.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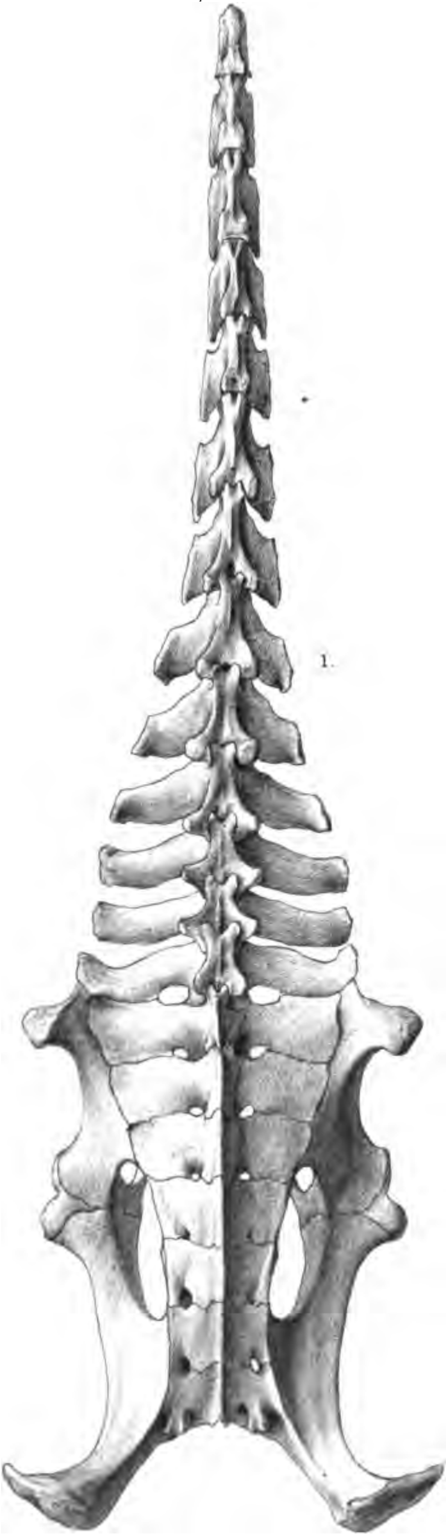
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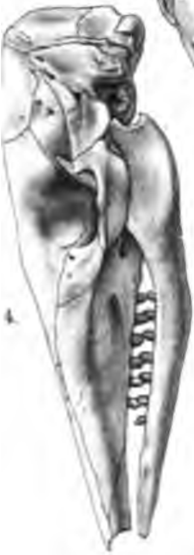
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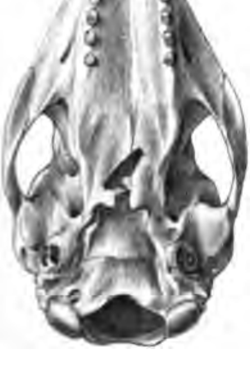
3.

G. H. Ford

Mintern Bros imp

MULETIA SEMPTEMCINCTA.

The animal is peculiar in having only six free regular dorsal rings, and a seventh ring that is partly separated from the hinder dorsal disk on the lower part of the sides.

The tail is short, conical, thick, and depressed at the base, rather more than half the length of the dorsal disk, and composed of thirteen or fourteen rings, each consisting of two series of *tesseræ*. The ears are small and covered with very minute scales.

The skeleton agrees very much in the form of the greater number of bones with that of the *Tatou noir* (*Tatusia peba*), figured by Cuvier (Oss. Foss. v. part ii. t. x.), and differs chiefly from it in the breadth of the ribs, in the shortness of the tail, which is not two thirds of the length of the body, the shortness of the thirteen vertebræ of which it is composed, and in the great width of the lateral processes of the first six caudal vertebræ, the first of which is as broad as the sacrum; they gradually diminish in breadth as they proceed towards the end.

The tail of the *Tatou noir* (*Tatusia peba*) consists of twenty-two or twenty-three vertebræ, and has much smaller lateral processes, and is much longer than the body and head.

The skull is 2 inches 8 lines long, and 1 inch 2 lines wide at the zygomatic arch. The lachrymal bone is triangular, the lower side forming the front part of the keel of the zygomatic process. The nasal bones are slender, attenuated behind. The upper jaw has six teeth on each side, the front one slightly directed forwards; the lower jaw has seven teeth on each side, the two front ones more slender and directed forwards.

Cuvier, in his 'Ossemens Fossiles' (v. p. 118) refers to this species the Armadillo noticed by Belon (Observations, p. 467) and Aldrovandi (Quadrup. Digit. p. 489); but I much doubt their knowing a species that appears to be confined to the pampas of South America, and believe that the resemblance depends on the rudeness of old figures and descriptions.

Schreber, in his 'Säugethiere,' 1775, describes a species which he considers to be the *Dasypus septemcinctus* of Linnæus (Syst. Nat. p. 54), and he refers to a plate, t. lxxii., which is marked by mistake *D. sexcinctus*, Linn., quite different from the species which he figures under the same name in t. lxxi. B. The figure moderately well represents this species; but the body has been elongated in stuffing, and the tail is too slender at the base; but this occurs also in the specimen in the Museum.

D'Azara (Hist. Nat. Quadrup. 1801, ii. p. 186), under the name of *Tatou moulet*, says it is called *Tatou m'bouriqua*, on account of its having straight and parallel ears like a mule, but observes the ears are not so large as in the other species. M. Desmarest, who inserted it in the scientific catalogues, gave it the Latin name of *Dasypus hybridus*, I suppose as a translation of Azara's name; but why it should be called a mule or hybrid I cannot conceive, as no species can be more distinct in external appearance and anatomical characters. It cannot be a mule or hybrid between any two known species, as D'Azara justly observes.

Mr. Martin, in the Society's 'Proceedings' for 1837,
count of the unsatisfactory account of *Dasypus hybrid*
mulet) given in scientific works, gave a more complete
this species than he had previously met with, from a specim
to the Society by Mr. C. Darwin; and Darwin gives a
of the habits of the animal in the 'Voyage of the Beagl

I am inclined to form a genus for *Dasypus septemci*
may be called *Muletia*, and characterized by the short t
at its base, the small number of caudal vertebræ and
and the small ears.

I would divide the *Tatusiidæ* thus:—

I. *Tail with smooth caudal rings. Hinder part of p*
with a groove on each side, which is wider beh

1. Tatusia. Tail cylindrical, elongate, as long as or
the body, of many rings and numerous caudal vert
large. Dorsal disk with 9–7 free bands. *Tatusi*

2. Muletia. Tail short, depressed at base, not so
body, with thirteen rings and thirteen caudal vert
small. Dorsal disk with six free bands. *Mul*
cincta &c.

II. *Tail with the hinder edge of the tesseræ of the*
rings prominent. Hinder part of the palate br
with a raised edge on each side.

3. Praopus. Tail about the length of the body, ra
the base. *Praopus kappleri.*

In the 'Hand-list of Edentate, Thick-skinned, a
Mammals in the British Museum,' I described seve
Tatusia and one of *Praopus*, and figured the skull of
kinds; but at that time the collection did not contain
of the Short-tailed Armadillo (*Tatusia septemcincta*) fr

The number of teeth seems to vary in this genus;
the Museum of *T. peba* (Hand-list, t. i. f. 1), *T. lept*
f. 3), *T. mexicana* (t. ii. f. 3), and *T. boliviensis* (t. i
seven teeth on each side of the upper jaw. *T. granadia*
T. brevirostris (t. iii. f. 2), and *T. leptocephala* (t.
eight teeth on each side of the upper jaw, as is also
Praopus kappleri (t. iv. f. 2 & 3).

EXPLANATION OF PLATE XLI.

Fig. 1. Vertebral column and pelvis of *Muletia septem*
2. Upper surface of skull.
3. Under surface of skull.
4. Side view of skull.

May 5, 1874.

Dr. E. Hamilton, V.P., in the Chair.

The Secretary made the following report on the additions to the Society's Menagerie during April 1874 :—

The total number of registered additions to the Society's Menagerie during the month of April was 119; of which 11 were by birth, 51 by presentation, 45 by purchase, and 12 received on deposit. The total number of departures during the same period by death and removals was 61.

The most noticeable additions during the month were :—

1. A male Vigne's Sheep (*Ovis vignii*, Blyth), presented by Captain Archibald, April 7th, being the first example of this animal brought alive to Europe.

2. A White-cheeked Flying Squirrel (*Pteromys leucogenys*, Temminck) from Japan, presented by Mr. A. Gower, H.B.M. Consul at Hiogo, Japan, April 15th ; likewise the first example received.

3. The typical example of *Halmaturus luctuosus* of D'Albertis (described *anteà*, p. 110), deposited by Signor L. M. D'Albertis, C.M.Z.S., April 17th.

This is certainly a new and most interesting form of Kangaroo, remarkable for its narrow elongated face, short ears, and the naked extremity of the tail, with which alone it touches the ground in moving. It will probably be found to belong to a new genus ; but an examination of the teeth is necessary to decide the point.

The drawing by Mr. Keulemans, which I exhibit (Plate XLII.), will render its external form easily recognizable.

The single known specimen, as previously mentioned, was obtained by H.M.S. 'Basilisk' at the southern extremity of New Guinea, and brought to Sydney, where it was purchased by M. D'Albertis.

4. Four Bladder-nosed Seals (*Cystophora cristata*), brought from the Arctic Seas, and presented by Captain D. Gray, of the S.S. 'Eclipse,' and Captain Alexander Gray, of the S.S. 'Labrador,' April 24th. One of them is a fine male, larger than any we have yet had, supposed to be about two years old.

Mr. Sclater called the attention of the meeting to the Cassowary in the Society's Gardens, received from the Zoological Society of Amsterdam in 1871[*], and described and figured in the 'Proceedings' for 1872 (p. 147, pl. ix.) under the name *Casuarius kaupi*, which was now a fine adult bird. It now appeared, from Professor Schlegel's remarks in the recently published part of the 'Musée des Pays-Bas,' and from Hr. v. Rosenberg's article in the 'Journal für Ornithologie' for 1874 (p. 390), that there could be no longer any doubt that the name *Casuarius kaupi* of Rosenberg had been founded on a young example of *C. uniappendiculatus*. It remained, therefore, to find another name for the present bird. Mr. Sclater had

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[*] See P. Z. S. 1871, p. 627.

at first supposed it might be referred to *C. papuanus*;
from the description of this species given by Schlegel
could not be the case. He had therefore designate
westermanni, after the distinguished Director of t
Gardens at Amsterdam, through whom the Society
their unique specimen.

Mr. Sclater announced that H.M. Government ha
the request of the Royal Society to send out a
Kerguelen's Land to accompany the astronomical expe
island for the observation of the transit of Venus, and
A. E. Eaton had been selected for the post.

Mr. W. T. Blanford exhibited some horns of the
Persia (*Capra ægagrus*), and also for comparison two p
to the same animal from Sind, lent by Mr. E. Ward.
out that these were identical, and that it appeared pro
wild Goat of Northern Persia, Asia Minor, and Crete
as that of Southern Persia and Sind; but hitherto
unable to compare heads. Of the Persian horns ex
which had been collected by Major St. John, R.E.,
from Shiráz, and the remainder, two pairs and an o
Isfahán. Compared with the figure of *C. ægagrus*
'Wirbelthiere Europa's,' the only perceptible differenc
horns there figured were rather more curved inwar
points. These latter horns were probably from Asia
Caucasus; but no locality was assigned.

The Goat of Northern Persia was undoubtedly th
Pallas, *Capra ægagrus* of Schreber. An earlier nam
Capra bezoartica of Linnæus; but it was impossible
Persian Wild Goat, or any other known Persian r
Linnæus's description, "*cornibus teretibus arcuatis t*
gula barbata." The description of the bearded throa
with that of the Persian Wild Goat; the account
arcuate, and annulate horns must have been taken fr
ruminant, probably from the Persian Gazelle. But t
artica was probably intended to apply to *C. ægagru*
the true bezoar, so widely famed in mediæval times as
poison, was obtained. Bezoars, it was true, occurred in
of many ruminants; but those obtained occasionally fr
Wild Goat long enjoyed a surprising and superstitic
which still exists amongst the Persians, who consider t
secretions a kind of universal remedy.

The name of *Antilope bezoartica* had been inco
by several naturalists to the Common Indian Antel
name for which was *Antilope cervicapra* (Linn.), it b
cervicapra of Linnæus.

The following papers were read:—

1. On some Points in the Anatomy of the *Columbæ*. By A. H. Garrod, B.A., Fellow of St. John's College, Cambridge; Prosector to the Society.

[Received March 19, 1874.]

In the present communication it is not my intention to describe in detail the anatomy of any single kind of Pigeon, because that can be, most of it, learnt from the dissection of any common species; but, from the opportunities which are presented to me in the performance of my prosectorial duties, it will be my endeavour to point out those peculiarities which I have been able to recognize in the soft parts of the large number of generic forms of the Columbæ that have passed through my hands. It is my hope that those naturalists who have opportunities of examining genera and species which it has not been my good fortune to obtain, will record their observations, not omitting those points on which I shall endeavour to lay stress on the present occasion.

That there is not a perfect constancy in the pterylosis and visceral anatomy of the Pigeons has been known for some time. Nitzsch, in his work on Pterylography, incidentally mentions that in the genus *Goura* there are no cæca to the intestine, and that the gall-bladder is absent. The same facts are noted by Hunter*. The former naturalist also refers to the absence of the oil-gland in the same genus. Prof. Owen says† that the gall-bladder is constantly deficient—a statement which, as will be seen further on, requires some qualification. The fact that all the European species of Doves belong to the genera *Columba*, *Turtur*, and *Pterocles* has caused zoologists to estimate the characters of the whole suborder more from these than from the much larger number found in extra-European countries; and the results arrived at from a more extended study tend considerably to modify the prevailing impression as to the constancy of certain characters.

The differences observable in the following structures have engaged my attention:—

1. The number of rectrices.
2. The presence or absence of the oil-gland, which is never otherwise than nude.
3. The presence or absence of cæca to the intestine, which in no genera, except in *Pterocles* and *Syrrhaptes*, exceed half an inch in length.
4. The presence or absence of the ambiens muscle, which does not seem as yet to have engaged the attention of naturalists, so far as this suborder of birds is concerned.

I. *The number of tail-feathers in the different genera of the* Columbæ.

Nitzsch divides the Pigeons into those with 12 and those with

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* Essays and Observations, vol. ii. p. 291.

† Anatomy of Vertebrates, vol. ii. p. 177.

16 rectrices, and does not refer to any other num authors have recorded the number of tail-feathers genera. Twelve, fourteen, sixteen, and twenty are the I have been able to find in the different species wi able to examine, though in *Calœnas* one specimen h trices in the perfect tail, whilst most have twelve. I following list will show that in some of the genera t arities in the number of the tail-feathers which indic more than specific importance; for instance, in *Carp* is the typical number of the rectrices, but *C. novæ-z* from all its congeners in possessing only twelve:—

Name of genus and species.
Calœnas nicobarica ....
Chalcopelia puella ....
Chalcophaps chrysochlora ....
Chamæpelia talpacoti ....
Columba (all the species examined) ....
Ectopistes migratorius..................
Leptoptila crumenifera ....
Lopholæmus antarcticus ....
Macropygia phasianella ....
Metriopelia melanoptera..................
Starnœnas cyanocephala..................
Turtur (all the species examined) ....
Tympanistria bicolor ....
Zenaida martinicana ....
Carpophaga (all species examined* except *C.* *zealandiæ*) ....
Didunculus strigirostris ....
Geopelia (all species examined) ....
Leucosarcia picta..................
Ocyphaps lophotes ....
Phlogœnas cruentata ....
—— *crinigera* ....
Ptilonopus (all species examined except one cimen in Brit. Mus., marked *P. occipitali* with 16) ....
Treron (all species examined) ....
Zenaidura marginata ....
Goura coronata ....
—— *victoriæ* ....
Phaps chalcoptera ....
Pterocles alchata..................
—— *arenarius* ....
Otidiphaps nobilis ....

It will be observed, as has been remarked by P with the exception of *Zenaidura*, all the North Am possess 12 rectrices.

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[*] Including *C. spilorrhoa*, of which I have examined se

II. *The presence or absence of the oil-gland in the genera of the* Columbæ.

The oil-gland is present in most of the Pigeons; it is very small in the genus *Ptilonopus*. It need hardly be remarked that, when present, it is never tufted.

The oil-gland is present in all the specimens examined by me of

Calœnas,
Carpophaga,
Chalcopelia,
Chalcophaps,
Chamæpelia,
Columba,
Ectopistes,
Geopelia,
Leptoptila,
Leucosarcia,
Lopholæmus,
Macropygia,
Metriopelia,
Ocyphaps,
Phaps,
Phlogœnas,
Ptilonopus (? in *P. melanocephalus*),
Pterocles,
Turtur,
Tympanistria,
Zenaida,
Zenaidura.

The oil-gland is absent in all my specimens of

Didunculus,
Goura,
Starnœnas,
Treron.

III. *The presence or absence of cæca to the intestine in the genera of the* Columbæ.

My dissections lead to the result that the intestinal cæca are absent in more genera of Pigeons than they are present in, being found in only 7 out of 26. When present they never exceed a quarter of an inch in length (except in the Pteroclidæ), and are frequently not half that size. In *Turtur* they are generally shorter than in *Columba*.

Cæca are present in

Columba,
Ectopistes,
Macropygia,
Phlogœnas,
Pterocles,
Starnœnas,
Turtur.

Cæca are absent in

Calœnas,
Carpophaga,
Chalcopelia,
Chalcophaps,
Chamæpelia,
Didunculus,
Geopelia,
Goura,
Leptoptila,
Leucosarcia,
Lopholæmus,
Metriopelia,
Ocyphaps,
Phaps,
Ptilonopus,
Treron,
Tympanistria,
Zenaida,
Zenaidura.

IV. *The presence or absence of the ambiens muscle in th*
the Columbæ.

This muscle, of which the slender tendon runs in such
manner obliquely across the knee, arising from the sup
margin of the acetabulum, and inserted into the muscu
the flexor perforatus of the toes, is found in the greater
the Pigeons I have examined, being present in about th
of the genera.

The ambiens muscle is present in

Calœnas,
Carpophaga,
Chalcopelia,
Chalcophaps,
Chamæpelia,
Columba,
Didunculus,
Ectopistes,
Leptoptila,
Leucosarcia,
Lopholæmus,
Macropygia,
Metriopelia,
Ocyphaps,
Phaps,
Pterocles,
Turtur,
Tympanistria,
Zenaida,
Zenaidura.

The ambiens muscle is absent in

Geopelia,
Goura,
Phlogœnas,
Ptilonopus,
Starnœnas,
Treron.

The combination of the above-collected facts ought to
siderable service in any attempts at classification; for,
number of rectrices out of the question for the minute, o
possible variations of the three remaining characters, ther
which are found to exist; in other words there are Pigeon

(1) With an oil-gland, cæca, and an ambiens muscle, vi
Ectopistes, Macropygia, Pterocles, and *Turtur.*

(2) With an oil-gland, no cæca, and an ambiens musc
lænas, Carpophaga, Chalcopelia, Chalcophaps, Chamæpe
ptila, Leucosarcia, Lopholæmus, Metriopelia, Ocypha
Tympanistria, Zenaida, and *Zenaidura.*

(3) With no oil-gland, no cæca, and an ambiens musc
dunculus.

(4) With an oil-gland, cæca, and no ambiens muscle,
gœnas.

(5) With no oil-gland, cæca, and no ambiens muscle
nœnas.

(6) With an oil-gland, no cæca, and no ambiens muscl
pelia, Ptilonopus.

(7) With no oil-gland, no cæca, and no ambiens muscl
ron, Goura.

The only combination not found being that (8) in wh
three structures concerned, the oil-gland only is wanting.

The relative value of these different structural peculia
point on which their value in classification evidently hi
number of rectrices being the most variable of them, its

is most probably the least. Next, with regard to the oil-gland, it is evident that genera such as *Treron* and *Ptilonopus* are not very far separated, notwithstanding that there are important differences between them; yet the former wants the oil-gland and the latter possesses it, though but feebly developed in *P. jambu* and *P. mariæ,* and absent (apparently) in *P. melanocephalus.* It is also known that among the Psittaci this structure may or may not be developed. These considerations lead me to think that less stress should be laid on the oil-gland than on the two following characters.

The constancy of the cæca, as a point of more than family importance in all other birds, would lead me to consider their presence or absence as more significant than that of the oil-gland.

In my last communication to this Society* I gave reasons to show that the presence or absence of the ambiens muscle was a very significant fact in the classification of birds generally. This would lead me to lay considerable stress on the same point in any order or suborder in which it is found to vary.

Assuming then, as in my last paper, for reasons there stated, that the ancestral Pigeon possessed the ambiens muscle, and, on the same grounds, that it had cæca coli and an oil-gland, it is evident that the Pteroclidæ, together with *Columba, Turtur, Macropygia,* and *Ectopistes* have departed least from the ancestral type. The Pteroclidæ have branched off in another direction, as will be subsequently shown; and therefore *Columba, Turtur, Ectopistes,* and *Macropygia* (together with those undissected genera unmistakably allied to them) may be considered to be the least modified, and therefore most typical of the Columbæ.

From these, if the peculiarities of the ambiens muscle have the importance which I assign them, a branch sprang, in which the ambiens was undeveloped. This includes at the present day *Starnœnas, Phlogœnas, Geopelia, Ptilonopus, Treron,* and *Goura,* most of which possess 14 rectrices, and are confined to the Malay archipelago. This Treronine division, as it may be termed, seems to be preserved in its primitive form in *Phlogœnas,* in which no further structures are lost. *Starnœnas,* which, notwithstanding its peculiar distribution, must be considered as a member of it, loses the oil-gland, and *Geopelia,* as well as *Ptilonopus,* the cæca, whilst *Treron* and *Goura* are deficient in both.

The main stem seems to have shortly given off a second branch, in which the cæca coli were alone wanting. This Phapine branch is now represented, without further complication, by *Calœnas, Carpophaga, Chalcopelia, Chalcophaps, Chamæpelia, Leptoptila, Leucosarcia, Metriopelia, Ocyphaps, Phaps, Tympanistria,* and *Zenaida*; whilst from it has sprung *Didunculus,* without any oil-gland and with its quaint beak and remarkably long intestinal canal, which would indicate that its diet was usually one of fish, or more probably mollusca†.

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* P. Z. S. 1874, p. 111.

† It is through the kindness of Prof. Newton that I have had the opportunity of dissecting a specimen of this rare bird.

Respecting *Lopholæmus*, it may be mentioned tha
tunity I have had of dissecting it has been through
Mr. Edward Gerrard, who lent me two specimens
served, in spirit*. In these I could not find the le
accessory femoro-caudal muscle, which is well develo
Pigeons. This peculiarity, when taken in connecti
that, like *Carpophaga* only amongst the Phapinæ, it
bladder, makes me disposed to make it an independen
from the Carpophagine stem.

Most ornithologists seem to be very unwilling to
cidæ along with the true Pigeons in a single group,
the evidence brought forward by Nitzsch, and th
M. Blanchard. My own observations tend to sho
families are most intimately related, and that they
certainly included in the same suborder, though for
independent families.

Commencing with the osteological evidence on th
has been very fully discussed by Mr. Parker and
the skull presents strong Columbine features. The
are peculiarly curved, in a manner seen nowhere else
Pigeons; and as in them, and not in the Fowls, th
facets are situated midway between their two extremi
bones are, no doubt, peculiar; they are not at all t
rhinal, but present the extreme degree of modificatio
probably the result of the shortness and breadth of th
is, however, a nasal turbinal bone, partly occludi
external nares, as in the Pigeons, whilst the premax
the nasal bone is also of considerable length. The
are perfectly Columbine in some species (e. g. *Pter*
and are not much modified in others, never so much
of *Didunculus*. In the lower jaw there is no produc
angle, like that in the Gallinæ. The cranial artic
quadrate bone is also strongly bifurcate. The whol
be that of a Pigeon modified by the effects of a Gro

The furcula has no median symphysial plate o
The sternum is perfectly Columbine, the similarity
direction taken by the costal processes and the non
any true manubrial rostrum, in both which points th
different.

The head of the humerus presents an important ch
any number of birds' humeri those of the Columbæ
fied, if those of the Psittaci are excluded, becau
lamina or the ridge for the insertion of the great p
peculiar. In most birds the second pectoral muscle

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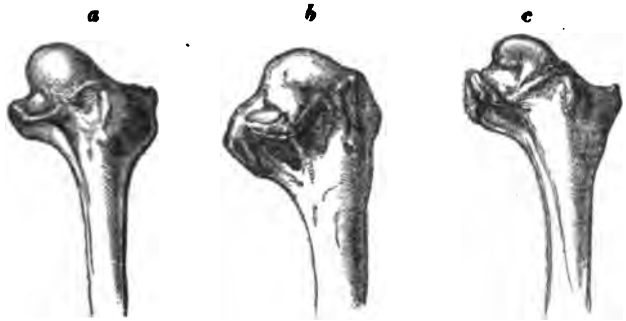
* An additional specimen has come into my hands si
written, by which the accuracy of my previous dissections of
firmed. No accessory femoro-caudal was present; there w
there was a large elongated gall-bladder and a small oil-gl
was remarkably small, with irregular pads, one of which so
that of *Ptilonopus*.

the proximal end of this ridge, or into a prolongation of it. In the Columbæ, Psittaci, and Alcidæ this is not the case; for in them it has quite an independent place of insertion into the general surface of the head of the bone at some distance from the pectoral ridge. An oval roughness indicates the spot. It is at the angle formed by the pectoral ridge and the main part of the bone in the Gallinæ, but nearer the other side of the bone in the Columbæ. A glance at the bone itself or the accompanying drawing of it (fig. 1) will explain the point more than any amount of description. It will also be found that the pectoral ridge in the Columbæ and some of the Psittaci ends proximally in a point, peculiar to them. The Pteroclidæ agree exactly with the Pigeons in all these points, and differ widely from all the Gallinæ.

Fig. 1.



Heads of right humerus of:—*a. Pterocles arenarius*; *b. Gallus bankiva*; *c. Columba livia.*

In all important features the pelvis of the Pteroclidæ differs with the Columbæ from the Gallinæ, as in having no strongly marked fossa on the inner surface of the ischium; but in the slight development of the transverse processes of some of the sacral vertebræ it is peculiar.

The general proportions of the muscles in the Pteroclidæ are perfectly Columbine. The pectoral muscles are similarly disposed, and the crop rests on the proximal surface of the great pectoral in a similar manner. In the leg the same resemblance maintains. Among muscles the ambiens, the femoro-caudal (A), the accessory femoro-caudal (B), the semitendinosus (X), and the accessory semitendinosus (Y) are all present in Columbæ and in Gallinæ, which prevents any difference in myological formula* from assisting in distinguishing them. In the obturator internus muscle a well-marked contrast between the Pigeons and Fowls is observed, which also shows that *Pterocles* is one of the former. In *Columba* and the whole suborder this muscle is small, narrow, and elliptical; but in *Gallus* and all its allies it is triangular and very large at its base. The similar number of carotid arteries in the Columbidæ, Pteroclidæ, and Gallinæ prevents any inference being drawn from them; and the same may be said of the œsophageal crop.

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* See P. Z. S. 1874, p. 111.

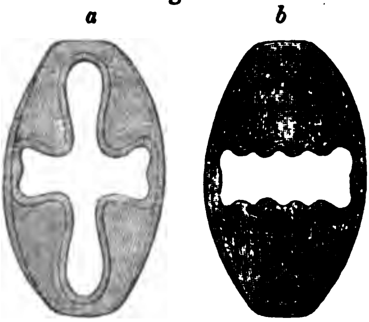
In the cæca of the intestine in the Pteroclidæ there is, no doubt, a strong likeness to the Gallinæ; for whilst, as above shown, they are very short or absent in the Columbæ, they are voluminous and long in the Sand-Grouse and Fowls, being in the former between 4 and 5 inches from end to end. As in all the Gallinæ and some Columbæ (*Carpophaga* and *Ptilonopus*), the Pteroclidæ possess a gall-bladder.

The following Table gives the length of the intestine, from the gizzard to the cloaca, in the species named. The most peculiar point to be noticed is its excessive length in *Didunculus*:—

Name of bird.	Length of intestine.	
	ft.	in.
Carpophaga aurora	1	10
—— *ænea*	1	6
Chalcopelia chalcospilos	1	6
Chalcophaps chrysochlora	1	8½
Columba maculosa	2	8
Didunculus strigirostris	7	0
Ectopistes migratorius	2	6
Geopelia cuneata	0	8½
—— *humilis*	1	6
—— *placida*	1	1
—— *striata*	0	11½
Goura coronata	5	1
—— *victoriæ*	4	0
Lopholæmus antarcticus	1	4½
Macropygia phasianella	2	8
Metriopelia melanoptera	2	0
Ocyphaps lophotes	2	3
Phaps chalcoptera	2	6
Pterocles alchata	1	6
—— *arenarius*	2	1
Ptilonopus jambu	1	0
—— *mariæ*	0	11
—— *melanocephalus*	0	9
Starnœnas cyanocephala	2	10
Treron calva	2	4½
Turtur aldabranus	1	8
—— *chinensis*	1	6
Zenaida martinicana	1	11
Zenaidura carolinensis	2	0

In nearly all Pigeons the gizzard is well-developed after the ordinary type; in some the pad on which the food is triturated is longitudinally grooved or plicated, whilst in others it is smooth; its ossification in the Nicobar Pigeon (*Calœnas nicobarica*) has already attracted attention*. In *Carpophaga* the stomach is very feebly muscular, not being more powerful than in strictly fruit-eating birds, such as the Hornbills. It is in the genus *Ptilonopus* that a form of gizzard is developed *such as is not found in any other bird.* In *P. mariæ*, *P. melanocephalus*, and *P. jambu* it is exactly the same, being composed of four pads instead of two. A horizontal section of an ordinary gizzard presents the well-known section represented in fig. 2, *b*, it being composed of two muscular masses, which push the two pads together in a manner which I have explained elsewhere †. But in *Ptilonopus* the section is much more elaborate, in a direction to which no other gizzard is known to approach; so that by the gizzard alone the genus whence it came could be determined with certainty. The accompanying figure (*a*) represents the section made exactly in the same direction as in the former case; and from it the four longitudinal muscular masses, which are here seen cut across, are well displayed, leaving a cruciform cavity between them, through which the food passes whilst being triturated. This gizzard is small in proportion to the size of the bird. No approach to a like condition is to be observed in *Treron*, the section of the gizzard in that genus being quite of the ordinary form figured above.

Fig. 2.



Horizontal section of the gizzard of:—*a. Ptilonopus jambu*; *b. Treron calva.*

It is generally said that the gall-bladder is absent in the Columbæ; and this is so in most of them; but besides being developed in the Pteroclidæ, it is found in all the species of *Ptilonopus*, *Lopholæmus*, and *Carpophaga*. In this point also *Ptilonopus* therefore differs from *Treron*.

The following Table contains the names of the different genera of the Columbæ arranged in the manner suggested above. As a classification of the suborder it is not at all my desire to put it forward as an ultimate one, but simply as the expression of the known facts of their structure. A more extended series of observations may indicate reasons for modifying the stress laid on some of the points; but it cannot, if my dissections are correct, change the facts themselves. As an instance of the direction in which alterations may be shown to be required, the case of the relation of *Ptilonopus* and *Treron* may be taken; for, notwithstanding their general similarity in structure, these two genera present important points of difference. In the possession of a gall-bladder by the former, it resembles *Carpophaga*; and it is quite possible that the similarity of the two genera under consideration is the result of similarity in habit only, and that whilst the latter (*Treron*) sprang from the Treronine stem direct, the former (*Ptilonopus*) may have descended from the Phapine stock. This appearance of the gall-bladder in these genera is very difficult to explain, except on the supposition that in those in which it is absent it has been lost very lately, or that *Carpophaga* and *Ptilonopus* are very intimately related forms. The uncertainty of its appearance in closely related genera of Mammalia reduces its value as a character of classificational importance among them; but its very general absence in the Columbæ makes it almost impossible not to lay considerable stress, in classification, on its presence. In the accompanying Table *Ptilonopus* is placed in the same division with *Treron* because of their similarity in the points there laid stress on; but it requires a very inconsiderable amount more evidence to necessitate its being removed from there into close proximity with *Carpophaga* and *Lopholæmus*. The fact that two forms in many respects so similar should differ so much in others is of itself a strong argument in favour of their separation; for the probability that forces which tend to produce marked external resemblances should simultaneously develop internal differences is, to say the least, extremely small.

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* See Prof. Flower's observations, P. Z. S. 1860, p. 333, and Mr. Bartlett's note, *ib.* p. 99.

† P. Z. S. 1872, p. 525.

Suborder COLUMBÆ. Schizorhinal birds with a characteristic pterylosis, humerus-head, and sternum; with the fourth gluteal muscle, which in other schizorhinal birds covers the femur-head, undeveloped; with the oil-gland nude, when present, and with the gall-bladder generally absent.

Family COLUMBIDÆ. Columbæ in which the intestinal cæca never exceed half an inch in length.

Subfamily COLUMBINÆ. Columbidæ possessing the ambiens muscle, intestinal cæca, an oil-gland, no gall-bladder, and 12 rectrices.

Genus *Columba*.
,, *Turtur*.
,, *Macropygia*.
,, *Ectopistes*.

Subfamily PHAPINÆ. Columbidæ possessing the ambiens muscle and *no* intestinal cæca.

Division α. The oil-gland present, no gall-bladder.

Genus *Chamæpelia.* „ *Metriopelia.* „ *Zenaida.* „ *Zenaidura.*	American.
„ *Calœnas.* „ *Chalcopelia.* „ *Tympanistria.* „ *Ocyphaps.* „ *Leucosarcia.* „ *Phaps.*	Old-World.

Division β. The oil-gland and gall-bladder present.

Genus *Carpophaga.*

Division γ. The accessory femoro-caudal muscle absent (it being present in all other Columbæ); the oil-gland and gall-bladder present.

Genus *Lopholæmus.*

Division δ. The oil-gland and gall-bladder absent.

Genus *Didunculus.*

Subfamily TRERONINÆ. Columbidæ wanting the ambiens muscle.

Division α. With intestinal cæca and an oil-gland; no gall-bladder.

Genus *Phlogœnas.*

Division β. With intestinal cæca, no gall-bladder, and no oil-gland.

Genus *Starnœnas.*

Division γ. With an oil-gland, no gall-bladder, and no intestinal cæca.

Genus *Geopelia.*

Division δ. With no intestinal cæca, no oil-gland (or a very small one), and scutellated tarsi.

Genus *Treron.*
„ *Ptilonopus.*

Division ε. With no intestinal cæca, no oil-gland, no gall-bladder, and tarsi reticulate.

Genus *Goura.*

Family PTEROCLIDÆ. Columbæ in which the intestinal cæca considerably exceed half an inch in length.

Subfamily PTEROCLINÆ. Pteroclidæ possessing the ambiens muscle, a gall-bladder, and an oil-gland.

Genus *Pterocles.*
„ *Syrrhaptes.*

2. On the Occurrence of a new Species of *Euphysetes* (*Euphysetes pottsii*), a remarkably small Catodont Whale, on the Coast of New Zealand. By JULIUS HAAST, Ph.D., F.R.S., Director of the Canterbury Museum.

[Received March 26, 1874.]

Amongst the specimens lately added to the collections in the Canterbury Museum, either new to science or at least to New Zealand, none is more interesting than that of a remarkably small Catodont Whale, allied to *Euphysetes grayii*, which was stranded amongst the rocks in Governor's Bay near Ohinitaki, the residence of T. H. Potts, Esq., F.L.S., by whom it was secured and presented to the Canterbury Museum.

As far as I am aware, only another species of the genus *Euphysetes* exists in the Australian Museum, obtained in 1851 in Port Jackson, of which a description was given in Wall's 'History of a New Sperm Whale,' 1851, 8vo, p. 37, t. 2 (skeleton), but which, according to Krefft, was entirely written by the eminent zoologist W. Sharpe MacLeay (see British-Museum 'Catalogue of Seals and Whales,' p. 218 *et seq.*).

The specimen under review was found by some fishermen amongst the rocks on the 17th of August of this year, when it tried in vain to regain the sea, but was easily secured.

As Mr. Potts was kind enough to send immediately a telegram from Lyttleton, the taxidermist of the Museum, Mr. F. R. Fuller, was enabled to proceed at once to the spot, by which not only all necessary measurements were secured before the animal was cut into for procuring the oil, but also both skin and skeleton were obtained in perfect order.

The animal on examination proved to be a female, apparently full-grown, and had the following dimensions:—

	ft.	in.
Total length	7	2
Breadth of tail	1	4½
Around body behind pectoral fins	4	2½
„ „ behind eye	3	3
„ „ before dorsal fin	3	10
Pectoral fin, length	0	9
„ breadth	0	3¾

Colour black, belly greyish white.

There is only one single valve covering the blow-holes, the slit being 2 inches long, of which 1½ inch lies on the left and ½ an inch on the right side of the top of the head. The skin surrounding the valve is raised in a lunate form rather conspicuously on the left side, open posteriorly; the left side of the valve is far more developed and stronger than the right one. The animal, however, was unfortunately too much disfigured on the top of the head by blows or other causes, so that it was impossible to ascertain whether the small channel of the right blow-hole had an opening of its own so that it could throw out a separate jet of water, or, what is more likely, could only add a minute quantity to the main jet thrown out by the left blow-hole, of which more anon.

The form of the dorsal fin, also, could not be well ascertained, as the hind edge, which is described by MacLeay as nearly perpendicular and concave, had in our specimen been torn away previously, the wound being well scarred.

The small eyes situated so low down the broad head, the pectoral fins of such inconsiderable size, the small mouth being placed, like that of a shark, well back, give to this animal a strange appearance.

When first examining the anatomical characters of the skull, it at once became evident that, if not identical with *Euphysetes grayii*, it would be closely allied to it.

	ft.	in.
Entire length of cranium	1	1·5
Greatest breadth of cranium (at parietal region)...........................		11·2
Beak from notch, length.................		5·2
Beak, breadth at notch		6·1
Length of beak at occipital bone..........		5·5
Breadth of beak at occipital bone		6·8

From these measurements it will be seen that the beak is shorter than broad, but not quite so much truncated and blunt as in Gray's whale.

However, the most characteristic feature in the skull is the asymmetry of the bones, which makes it appear at first sight that we have a remarkable case of deformity before us.

MacLeay has given a masterly description of those anomalies, and has shown how, by the great development of some bones, such as the right intermaxillary, and by the stunted form of others, these striking contortions are brought about, by which that remarkable asymmetry is caused—to which I can add nothing, as his description agrees entirely with our New-Zealand skull.

The blow-holes are exceedingly disproportionate in size, the right one being scarcely the tenth of an inch in diameter, whilst the left is nearly fifteen times as large, of an oblong form, being 1½ inch long and 1⅛ inch broad. The rami of the lower jaw are very thin and fragile, and have, like Gray's whale, scarcely any condyles. It agrees also with the latter, except in the position of the teeth, having 13 on each side, which are described by MacLeay as projecting horizontally and being curved upwards. In the New-Zealand species they have the same slender conical form, but stand out sideways with their points curved inwards, the last tooth on each side, however, being curved forward, its hook nearly touching the preceding one; the first two teeth on each side stand nearly perpendicular to the jaw, whilst the rest incline slightly backward, with the exception of the last tooth, which has again a perpendicular position. All these teeth fit into sockets on both sides of the roof of the mouth, provided for their reception in the gums.

However these minor deviations would not constitute such a specific difference as to separate it from the Australian species did not the rest of the skeleton present such marked differences.

MacLeay states that Gray's *Euphysetes* has 52 vertebræ; but I find that there must be some mistake in the enumeration of the different forms of vertebræ, because when added they only amount to 51, viz.:—7 cervical, 14 dorsal, 9 lumbar, 21 caudal (of which 13 have chevron bones attached together); total 51.

The number of the vertebræ of the New-Zealand *Euphysetes* is one less, namely 50; moreover they are differently arranged. Its seven cervical vertebræ are soldered together and have all the peculiar characteristics of the Australian species, whilst it has only 12 dorsal (instead of 14), 11 lumbar (instead of 9), and 20 caudals with 8 chevron bones attached (instead of 21).

The Australian species has 14 ribs, whilst the New-Zealand species has only 12, of which the first one is broad and flat and has, like the second, third, fourth, fifth, and sixth, two articulating surfaces, whilst, according to MacLeay, the Australian species has only one articulating surface on the first rib; the second rib still exhibits a considerable breadth, whilst the succeeding ones become gradually narrower; the last six ribs, which assume a rounded shape, possess only one articulating surface.

Thus, even supposing that the minor differences in the form of the skull might possibly be due to sex, the number, arrangement, and form of the vertebræ and ribs alone would prove the distinct specific character of the New-Zealand specimen, for which, therefore, I wish to propose the specific name of *Euphysetes pottsii*, in honour of T. H. Potts, Esq., F.L.S., by whom the specimen was secured to science.

The contents of the stomach consisted of a dark slimy matter from which no clue could be obtained as to the usual food of the species under review; but we may conclude, from the absence of the horny beaks of Cephalopods, of which some years ago we obtained nearly half a bushel in the stomach of *Berardius arnouxii*, that this species does not feed on them; moreover the position and smallness of the mouth shows that this animal is probably a ground-feeder, existing perhaps on the smaller Hydroid Zoophytes.

Before concluding I wish to draw attention once more to the remarkable asymmetry of the cranium of this new whale, which, probably more than any other known catodont cetacean, shows this so conspicuously. We are so accustomed to observe almost invariably in the skeletons of the vertebrates a perfect bilateral symmetry, that any deviation from this rule is generally regarded, if not as a monstrosity, at least as a deformity. It is therefore very striking to find, in a whole and important cetacean section, the Denticete, the upper surface of the skull, with very few exceptions, unsymmetrical, amongst which the family of the Catodontidæ is the most conspicuous. This family, amongst other characteristics, is distinguished by the nostrils being enormously disproportionate in size, the left one being the largest; at the same time the nasal bones, as those of the face, are generally unsymmetrical and distorted.

Of them, the genus *Euphysetes* may be said to possess this unsymmetrical distortion of the skull and the difference in the size of the nostrils in the highest degree.

Systematic zoologists have generally hitherto had little time to do more than to fix the so-called generic and specific characters, without being able to examine into the causes why certain animals exhibit such peculiar forms and colours and why their skeletons have assumed the distinct morphological characteristics by which they are distinguished from all others.

We can understand that the use or disuse of certain limbs of an organism may develop them to a more or less degree, or stunt their growth, by which other portions of the skeleton will in their turn become differentiated.

Thus, to give only one instance, the disuse of the wings of the Kakapo (*Strigops habroptilus*) has also altered the form of the sternum (which has such a very prominent keel in the whole Parrot tribe) to such an extent that it is only feebly marked; but in this case, as in most others, the symmetry of the skeleton is not interfered with.

In some other cases (as, for instance, in the Pleuronectidæ or flatfishes) we can easily trace the asymmetry of their skeleton to adaptation, viz. to their mode of obtaining food and at the same time preserving themselves from their enemies. If in the struggle for existence they had not in the course of ages assumed their present form, they would doubtless have long become extinct. Moreover we know that the flatfishes are symmetrical in the young state, and as they grow older the skull not only becomes distorted but one eye actually crosses gradually from one side to the other to take its place close to the other eye.

However in the instance of the Toothed Whales, at least at first sight, such vital considerations do not appear to exist; the blow-holes or naso-palatine breathing-passages, situated on the very top of the head, by which the cetaceans have to expose only a very small portion of their body when they rise to the surface for expelling the pulmonary discharge of used-up air, by which the spout is generally formed, and for oxygenizing again the blood by inhaling a great quantity of atmospheric air, do not receive more protection by being so remarkably unequal in size. Moreover it appears to me that an animal would breathe as freely and effectually if the blow-holes were of equal size, of course always provided that the quantity of air to be inhaled and of the pulmonary vapour to be expelled found the same amount of room for passing to and fro. Thus in the skull of the *Epiodon chathamiensis* described by Hector, and of which we possess a fine skeleton in the museum, the blow-holes, although twisted considerably to the left, are of the same size; but the asymmetry of the upper portion of the skull is produced by the right intermaxillary bone being far more developed than the left one, and, moreover, rising as a broad ridge to the very summit of the skull, and forming there a crest of considerable size on the right side only.

Unfortunately I have not access to all the necessary works of reference to inquire if this question, as to the causes, growth, and uses of asymmetry in the Toothed Whales, has already been treated by naturalists in the northern hemisphere; but it is evident, from an examination of the drawings representing the three views of the fœtal Cachalot (*Catodon*) in the Museum of the Royal College of Surgeons, that the remarkable asymmetry exists already in that early stage of existence.

On the other hand I may ask, why should the *Balænidæ* have a symmetrical skull, breathing, as they do, exactly in the same manner as the Toothed Whales? Eschricht, who has described the important changes which the skulls of the *Balænidæ* undergo, has shown that they are in the fœtal state quite symmetrical, although later on slight inequalities in the maxillæ are sometimes discernible.

As far as I am aware, no cognizable reason can be given to account for this asymmetry in the skull of the Toothed Whales, and we are therefore almost led to assume that some of their remote ancestors were deformed by some accident and that thus this asymmetry of the skull was inherited by their progeny to a more or less extent, because it is difficult to believe that in the struggle for existence, in the adaptation to altered circumstances and a different mode of life, this strange asymmetry could be of any vital importance.

The study of the ontogeny of this species and of the phylogeny of the family to which it belongs, and of its extinct ancestors is therefore of the highest importance in considering the question of the origin of species, because every step in that direction is a clear gain to science.

It may be possible that this point has already been treated at length by some naturalists; but I am not aware that this is the case; and my wish to draw the attention of my brother naturalists in New Zealand, and other countries where an opportunity is offered by acquiring specimens of Toothed Whales in all stages of growth to study this striking fact in osteology, has been my only motive for alluding here more fully to it than I should otherwise have done.

3. List of Diurnal Lepidoptera collected in Cashmere Territory by Capt. R. B. Reed, 12th Regt., with Descriptions of new Species. By FREDERIC MOORE, India Museum, London.

[Received March 27, 1874.]

(Plate XLIII.)

The only notices hitherto published of the species of Lepidoptera known to inhabit Cashmere are those by Kollar in Hügel's 'Kashmir,' and recently by Capt. Lang of a small collection made at Goolmurg by the late Dr. Jerdon.

Capt. Reed says, *in litt.*:—"I was on the whole much disappointed with Cashmere as a field for the entomologist; by Cashmere I mean the valley itself, where the only butterflies seen are of the commonest species. My best hunting-grounds were the ranges of hills crossed *en route* from the plains to the valley, viz. the Pir Punjal range (11400 feet), the Ruttun Pir (8200 ft.); and Soonamurg, a beautiful plateau on the Ladak road, and some 7000 feet high, afforded good sport."

Fam. NYMPHALIDÆ.

Subfam. DANAINÆ.

1. **DANAIS AGLEA**, Cram. Pap. Exot. t. 377. f. E.

2. **DANAIS LIMNIACÆ**, Cram. *l. c.* t. 377. f. C, D.

3. **DANAIS CHRYSIPPUS**, Linn.; Cram. *l. c.* t. 118. f. B, C.

4. **DANAIS PLEXIPPUS**, Linn.; Cram. *l. c.* t. 206. f. C, D.

5. **EUPLŒA CORE**, Cram. *l. c.* t. 266. f. E, F.

Subfam. SATYRINÆ.

6. **LETHE DYRTA**, Feld. Reise Novara, Lep. iii. p. 497.

7. **AMECERA SCHAKRA**, Kollar, Hügel's Kasch. iv. p. 446, t. 15. f. 3, 4.

8. **EPINEPHILE MAIZA**, Lang, Ent. Monthly Mag. 1868, p. 36, ♀. (Plate XLIII. fig. 6, ♂).

Male. Upperside dark brown: fore wing with a small, scarcely perceptible ocellus. Underside ferruginous brown: fore wing with the discal portion clear ferruginous, traversed by the dark veins and crossed by an angular discal band; a small subapical ocellus, distinct, iris yellow, white-pupilled: hind wing with a small subbasal ferruginous patch, and an irregular transverse discal series of yellowish spots.

Female differs only in having two small distinct ocelli on upperside of fore wing, each with bright yellow iris, but without white pupil.

Exp. 1½ inch.

Hab. Goolmurg; common.

9. **EPINEPHILE NEOZA**, Lang, *l. c.* p. 35.

Hab. Goolmurg.

10. **PARARGE CASHMIRENSIS**, n. sp. (Plate XLIII. fig. 3.)

Male. Upperside ochreous yellow, brownish at the base; cilia yellowish white, spotted with black: fore wing with a black dentate discocellular streak and a dark ochreous-black exterior border, the inner margin of which commences one third before the apex and curves half round a subapical white-pupilled black spot, and thence attenuates to posterior angle: hind wing with a broad ochreous brown exterior border with waved inner margin, contiguous to which are three black spots, each with a white pupil, the middle spot being the largest and the anterior the smallest.

Female differs in having two subapical spots and a broad discocellular patch on fore wing, and a fourth smaller anterior spot on hind wing.

Underside: fore wing paler ochreous, markings as in upperside, but greyish brown and with three narrow brown transverse streaks within the cell, and an irregular streak beyond it; two bright white-pupilled subapical spots, the upper one small, beneath which is a white dot, all being encompassed by a brownish line: hind wing with greyish-brown base and exterior border, the disk being whitish grey, the division marked by a dark brown irregular zigzag inner line and a wavy outer line; within this discal portion is a series of six round bright black spots, each having a white pupil (the basal two) and encircled by a yellow and a narrow brown outer ring, the second and third anterior spots being small, the others of equal size.

Exp. ♂ 2, ♀ 2$\frac{2}{10}$ inches.

Hab. Goolmurg, Cashmere.

Note. The nearest ally to this species is *P. eversmanni* from Central Asia, figured in the Moscow Bulletin for 1847.

11. **Callerebia daksha**, n. sp. (Plate XLIII. fig. 1.)

Male and *female.* Upperside dark brown: fore wing with a small subapical black-bipupilled ocellus: hind wing with a smaller subanal black spot, having a single white pupil; a white dot beyond it on the middle of the disk, some specimens showing also an intermediate dot.

Underside slightly paler, but uniform brown: fore wing with a pale ferruginous ring encircling the subapical ocellus, beneath which is a minute white dot: hind wing with a pale ferruginous ring encircling the subanal black spot; a minute anal and a transverse discal series of five prominent white dots, which in some specimens appear on a black spot with a ferruginous ring.

Exp. ♂ 1$\frac{6}{8}$, ♀ 1$\frac{7}{8}$ inch.

Hab. Goolmurg, Cashmere.

This is the smallest species of the genus yet described, and may be distinguished on the upperside by the absence of the ferruginous ring round the ocellus, on the underside by being of a uniform colour and without mottlings on hind wings.

12. **Aulocera swaha**, Kollar, Hügel's Kasch. iv. pl. 14. f. 1, 2.

These are brighter-coloured than specimens from Simla, and have the maculated band on fore wing clear chrome-yellow.

13. **Aulocera saraswati**, Kollar, Hügel's Kasch. iv. pl. 14. f. 3, 4.

14. **Aulocera weranga**, Lang, Ent. Monthly Mag. 1868, p. 247.

The smallest species of the genus.

15. **Melanitis ismene**, Cram. Pap. Exot. i. pl. 26. f. A, B.

16. **Melanitis bela**, Moore, Catal. Lep. Mus. E. I. C. i. p. 223.

This is a very distinct species, and is confined to the N.W. Himalayas.

Subfam. Acræinæ.

17. **Pareba vesta**, Fabr.; Donov. Ins. t. 30. f. 1.

Acræa anomala, Kollar, Hügel's Kasch. iv. pl. 3. f. 3, 4.

Subfam. Nymphalinæ.

18. **Atella phalanta**, Drury, Ill. Exot. Ins. i. t. 21. f. 1, 2.

19. **Argynnis childreni**, Gray, Lep. Nepal, t. 11.

20. **Argynnis kamala**, Moore, Catal. Lep. E. I. C. i. p. 156.

21. **Argynnis jainadeva**, Moore, P. Z. S. 1865, t. 30. f. 1.

22. **Argynnis rudra**, Moore, Catal. E. I. C. i. p. 157.

23. **Argynnis niphe**, Linn.; Cram. Pap. Exot. t. 14. f. B–E.

24. **Argynnis issæa**, Gray, Lep. Ins. Nepal, p. 11.

25. **Argynnis cashmirensis**, n. sp. (Plate XLIII. fig. 4.)

Male and *female*. Upperside bright ferruginous, markings black and very prominent: fore wing with the costa, base, and hind margin brown; three lunular marks within and an outward curved streak closing the cell; a dentate lunule below the cell; a transverse discal confluent zigzag series of spots; a suffused subapical patch; a submarginal recurved row of broad oval spots; a marginal row of dentate spots, and narrow exterior line which is angled on the veins: hind wing with the base brown, indistinctly streaked with black, and bordered by a distinct black zigzag lunular band; the outer portion marked as in fore wing; cilia alternate white and black.

Underside: fore wing fulvous, apex and exterior border streaked with yellow; markings narrower and less defined; anterior spots in submarginal and marginal rows with white dots; a black patch at base of hind margin: hind wing dark ferruginous; disk clouded with yellow; two small pearly-white streaks at base of wing, one above the other below the cell; a small black narrow streak at base and a white-bordered black spot within the cell; a curved median transverse band with irregular black angulated borders, composed of three pearly-white portions and yellow intervening spaces, the former disposed thus—(1) between the costal and subcostal, (2) at end of the cell and divided by the discocellular, (3) between the first and second median, the first and third being much constricted; a submarginal series of six white-centred black spots; a marginal row of pearly-white quadrate spots, each well separated by a dark ferruginous streak, and bordered interiorly with a narrow blackish dentate lunule. Body above blackish brown, beneath and legs dark yellow.

Exp. ♂ $1\frac{3}{8}$, ♀ $1\frac{5}{8}$ inch.

Hab. Soonamurg, N.E. of Cashmere valley.

This species belongs to the "*Selene*" group, and is allied to *A. jerdoni*, Lang, from Goolmurg, on S.W. side of the valley.

26. Melitæa balbita, n. sp. (Plate XLIII. fig. 5.)

Male. Upperside bright fulvous; markings prominent; cilia pale yellow, alternating with black; costal edge and veins black; base of wings and hind margins fuliginous black; both wings with a broad exterior marginal black band, traversed by prominent fulvous dentiform lunules: fore wing with a black constricted mark within the cell, a streak at the end, a short longitudinal streak below it from base of wing, and two transverse discal series of spots (the inner row being the largest): hind wing with black subbasal irregular transverse series of lunular marks.

Underside paler: fore wing with the veins fulvous; costa and exterior margin yellow; markings not prominent; cilia as above: hind wing with black veins; a basal band, a prominent discocellular spot, a broad curved discal band, and a marginal series of broad lunules yellow, all bordered by a black line; the discal band traversed by a blackish irregular line, the interbasal space bright fulvous, and the interdiscal space yellow, with bright fulvous spots; extreme outer margin and cilia yellow.

Female. Upperside dull, clouded fulvous; cilia paler; markings broader, confluent, the base of the wings more broadly dusky black, the interdiscal space somewhat yellow, and the marginal dentiform lunules more or less yellow. Underside as in male, excepting that the exterior marginal lunules of fore wing, and the basal, discal, and marginal band of lunules, as well as the discocellular spot of the hind wing is glossy yellow or dull silvery white.

Exp. ♂ $1\frac{4}{8}$, ♀ $1\frac{6}{8}$ inch.

Hab. Soonamurg, N.E. Cashmere.

The nearest European ally of this species is *M. athalia*.

27. Symbrenthia hyppocla, Cram. Pap. Exot. iii. t. 220. f. C, D.

28. Symbrenthia hysudra, n. sp. (Plate XLIII. fig. 8.)

Male. Differs from *S. hypselis* (figured by Boisduval and Doubleday) in being smaller, the hind wings more rounded exteriorly and shorter hindward. On the upperside the bands are of an orange-yellow, much broader and with irregular sinuous margins, the band from the hind margin of fore wing being joined to the subapical and extending thence inwards to the costa, from which a small streak ascends to near the apex; on the hind wing the submarginal band is narrower, has an even outer edge, and extends to very near the anterior angle; a narrow marginal line runs from anal to anterior angle. On the underside the tessellations are different but prominent; the submarginal band on hind wing is formed of short black transverse streaks, the second and third spaces only tinged with metallic greyish blue; a short black anal spot and two greyish-blue-streaked black-bordered lunules from caudal angle.

Exp. 1⅛ inch.

Hab. Cashmere.

29. Symbrenthia asthala, n. sp. (Plate XLIII. fig. 9.)

Male. Differs from *S. hypselis* in being much smaller. On the upperside the bands are of the same orange-red colour, but of a different shape and broader, the oblique subapical streak of fore wing being lengthened and extending nearly across the apex. On the underside the colour is nearly uniform orange-yellow, the tessellations somewhat different and the submarginal band composed of imperfectly formed conical lunules, partly dashed with metallic green; lunules from anal angle to tail similar to those in *S. hypselis*.

Exp. 1⅝ inch.

Hab. Cashmere.

30. Vanessa cashmirensis, Kollar, Hügel's Kasch. iv. p. 442, t. 11. f. 3, 4.

31. Vanessa xanthomelas, Denis, W. V. p. 175.

32. Vanessa charonia, Drury, Ill. Exot. Ent. i. t. 15. f. 1, 2.

33. Grapta c-album, Linn. S. N. i. p. 778.

34. Pyrameis cardui, Linn.; Esp. Schmett. i. t. 10. f. 3.

35. Pyrameis indica, Herbst, Nat. Schmett. vii. t. 180. f. 1, 2 (*callirhoë*, Hübn.).

36. Junonia lemonias, Linn.; Cram. Pap. Exot. i. pl. 35. f. D–F.

37. Junonia ænone, Linn.; Cram. *l. c.* i. t. 35. f. A–C.

38. Junonia orithyia, Linn.; Cram. *l. c.* i. t. 19. f. C, D, t. 32. f. E, F.

39. Junonia asterie, Linn.; Cram. *l. c.* i. t. 58. f. D, E.

40. Junonia almana, Linn.; Cram. *l. c.* i. t. 58. f. F, G.

41. Precis iphita, Cram. *l. c.* iii. t. 209. f. C, D.

42. Precis wedah, Kollar, Hügel's Kasch. iv. p. 437.

Precis hara, Moore, Catal. E. I. C. t. 3*a*. f. 1.

43. Kallima inachis, Boisd.; Cuv. Règ. Anim., Ins. ii. t. 139. f. 3.

Kallima hügeli, Kollar, Hügel's Kasch. iv. t. 9.

44. Cyrestis thyodamus, Boisd.; Cuv. Règ. Anim., Ins. ii. t. 138. f. 4.

Cyrestis ganescha, Kollar, Hügel's Kasch. iv. t. 7. f. 3, 4.

45. **Diadema bolina**, Linn. Mus. Ulr. p. 295 (1764); C
Icon. t. 21. f. 2.

46. **Diadema jacintha**, Drury, Ill. Exot. Ent. ii. pl. 21
2 (1773), ♀.

Diadema avia, Fabr. Ent. Syst. iii. 1. p. 111 (1793).

47. **Hestina nama**, Doubleday, Gen. D. Lep. t. 39. f. 2.

48. **Euripus consimilis**, Westw. Gen. D. Lep. p. 281,

Euripus hallirothius, Westw. *l. c.* p. 293, ♂.

49. **Limenitis hydaspes**, n. sp. (Plate XLIII. fig. 2.)

Male and *female*. Upperside dark rufous brown; both
with a transverse discal series of small oval white spots, and tw
marginal rows of prominent dentate ochrey red spots, whi
parallelly joined together by an intermediate row of dentate
spots, the outer row being also bordered by a black lunu
narrow black and a white streak within, and a ochrey red
closing the cell; two ochrey white spots before the apex.
side bright ochrey yellow, the discal maculated band and st
cell, as above, black-bordered; middle of the wings, outside t
cal band, and a marginal series of lunules ochrey red; two
lunules near posterior angle of fore wing.

Exp. ♂ 2⅗, ♀ 2⅜ inches.

Hab. Common about Cashmere.

Note. *L. ligyes* (Hewits.) may be distinguished fro
species in being of a dark or somewhat greenish-brown colo
discal maculated band being formed of larger spots, the subm
series of black dentate spots being bordered outwardly by a
(sometimes slightly fulvous white) dentate spot, and outer o
ginal hardly apparent blackish lunules; the underside is pal
has more black diffused along the borders of the discal bands

L. trivena (Moore) may also be known by its much paler
colour, and the very broad discal transverse band, which o
nearly one third of the wing, the underside being also of a ve
yellow. *L. ligyes* is apparently confined to the Kumaon distri
L. trivena to the Simla district of the N. W. Himalaya.

49*. **Limenitis danava**, Moore, Catal. Lep. E. I. C. i.
t. 6 *a*. f. 2.

50. **Neptis ananta**, Moore, Catal. Lep. E. I. C. p. 166,
f. 3, ♂.

Hab. Ruttun Pir.

The male only of this species was hitherto known; the fe
no way differs from the male, except in being larger.

51. **Neptis amba**, Moore, P. Z. S. 1858, p. 7, t. 49. f. 4

Hab. Ruttun Pir.

52. **Neptis astola**, Moore, P. Z. S. 1872, p. 560.

53. ATHYMA LEUCOTHOË, Linn.; Cram. Pap. Exot. iii. t. 203. f. E, F.

54. ATHYMA OPALINA, Kollar, Hügel's Kaschm. iv. p. 427; Moore Catal. Lep. E. I. C. i. t. 5 *a*. f. 2.

55. APATURA NAMOUNA, Doubleday, Ann. Nat. Hist. 1845, xvi. p. 178.

Apatura ambica, Kollar, *l. c.* t. 8. f. 3, 4.

56. DILIPA MORGIANA, Westw.; Moore, Catal. Lep. E. I. C. i. t. 6 *a*. f. 5.

57. CASTALIA DICHROA, Kollar, Hügel's Kaschm. iv. t. 8. f. 1, 2.

58. CHARAXES ATHAMAS, Drury, Ill. i. t. 2. f. 4.

Fam. ERYCINIDÆ.

Subfam. LIBYTHÆINÆ.

59. LIBYTHEA LEPITA, Moore, Catal. Lep. E. I. C. p. 240.

Subfam. NEMEOBIINÆ.

60. DODONA DURGA, Kollar, Hügel's Kasch. iv. t. 13. f. 3, 4.

Fam. LYCÆNIDÆ.

61. CHRYSOPHANUS PHLŒAS, Linn.

Chrysophanus chinensis, Feld. Verh. zool.-bot. Ges. xii. p. 488.

62. CHRYSOPHANUS PAVANA, Kollar, Hügel's Kasch. iv. t. 5. f. 5, 6.

63. CHRYSOPHANUS KASYAPA, Moore, P. Z. S. 1865, p. 506, t. 31. f. 10.

64. CHRYSOPHANUS ZARIASPA, n. sp.

Male. Allied to *C. kasyapa*, but is a smaller insect and differs on the upperside in having the black spots smaller and the marginal borders broader, the latter being suffused inwardly with purplish blue, this colour in certain lights pervading the entire wings. On the hind wing the spots are preceded by bluish-black streaks pointing inwards. On the underside the spots are also smaller, and the coppery red bordering the three spots at the posterior angle is much brighter.

Exp. 1⅛ inch.

Hab. Soonamurg, N.E. Cashmere.

65. POLYOMMATUS ARIANA, Moore, P. Z. S. 1865, t. 31. f. 2.

66. POLYOMMATUS GALATHEA, Blanch. Jacq. Voy. Inde. iv. t. 1. f. 5, 6.

Hab. Soonamurg.

67. POLYOMMATUS KASMIRA, Moore, P. Z. S. 1865, t. 31. f. 1.

68. Polyommatus chandala, Moore, P. Z. S. 1865, p
31. f. 3.

69. Scolitantides cashmirensis, n. sp.

Male. Upperside pale greyish blue, slightly glossed with
veins blackish; both wings with a black discocellular lunu
blackish exterior margin, the latter bordered inwardly by
lunules, which are most prominent on margin of hind win
they encircle a series of black spots; cilia alternate white a
Underside pale cream-colour: fore wing with a pale black
marginal series of narrow spots, a decreasing submargin
of darker spots, an irregular discal series of quadrate black
discocellular spot, two spots within the cell and a small spot
disposed in a triangle: hind wing with a marginal doub
black spots, which are joined together by an intervening
series of bright orange spots: a curved discal series of seven
black spots, three spots on anterior margin, a discocellula
and two small subbasal spots.

Female. Upperside dark fuliginous black, with a purplish
blue scales scattered from the base.

Exp. ♂ [illegible], ♀ [illegible] inch.

Hab. Sonamurg, N.E. Cashmere.

Allied to *S.* [illegible] and *S. vicrama.*

70. Thecla icana, Moore, P. Z. S. 1865, t. 31. f. 11.

71. Dipsas ataxus, Hewits. Ill. D. Lep. p. 66, t. 30. f.

72. Aphnaeus ictis, Hewits. *l. c.* t. 25. f. 8, 9.

73. Lycaena baetica, Linn. S. N. ii. p. 789.

74. Lycaena dipora, Moore, P. Z. S. 1865, p. 506, t.

75. Lycaena nara, Kollar, Hügel's Kasch. iv. p. 421.

76. Deudorix [illegible], n. sp.

Male and female. Upperside blackish brown, suffused wi
purple; cilia dull yellow: fore wing with a large quadrate
red discal patch: hind wing with a broad orange-red exter
ginal band crossed by the dark veins. Underside pale fawn
both wings crossed by a brown discal narrow band with wh
border: hind wing with a white marginal line, a small suba
spot bordered with red, and a large black anal spot bordered wi

Exp. ♂ $1\frac{1}{12}$, ♀ [illegible] inch.

Hab. Cashmere.

Allied to *D.* [illegible], Kollar, and figured as its female in He
D. Lep. pl. 10. f. 44.

77. Deudorix epijarbas, Moore, Catal. E. I. C. i.
Hewits. Ill. D. Lep. t. 7. f. 16–18.

78. Amblypodia rama, Kollar, Hügel's Kaschm. iv. t.

Fam. PAPILIONIDÆ.

Subfam. PIERINÆ.

79. **TERIAS HECABE**, Linn.; Cram. ii. t. 124. f. B, C.

80. **TERIAS DRONA**, Horsf. Catal. E. I. C. (1829), p. 137, t. 1. f. 13.

. 81. **PIERIS NIPALENSIS**, Gray, Lep. Ins. Nepal, t. 6. f. 13, (1846).

82. **PIERIS GLICIRIA**, Cram. Pap. Exot. ii. t. 171. f. E, F.

83. **PIERIS AJAKA**, Moore, P. Z. S. 1865, pl. 31. f. 16.

84. **PIERIS DAPLIDICE**, Linn. S. N. i. p. 760.

85. **PIERIS CORONIS**, Cram. Pap. Exot. t. 44. f. B, C.

86. **EUCHLOË DAPHALIS**, Moore, P. Z. S. 1865, pl. 31. f. 14.

87. **COLIAS HYALE**, Linn. Syst. Nat. i. p. 764.

88. **COLIAS FIELDI**, Ménétr. Cat. Mus. Petr. Lep. i. p. 79, t. 1. f, 5; Gray, Lep. Nepal, t. 5. f. 2.

89. **THYCA EUCHARIS**, Drury, Ill. Ex. Ent. ii. t. 10. f. 5, 6.

90. **THYCA BELLADONNA**, Fabr.; Donov. Nat. Rep. i. t. 35, ♀. *Thyca horsfieldii*, Gray; H.-Schäff. Ex. Sch. f. 13, ♂.

91. **METAPORIA NABELLICA**, Boisd. Spéc. Gén. Lép. i. p. 509.

Subfam. PAPILIONINÆ.

92. **PARNASSIUS HARDWICKI**, Gray, Lep. Nepal, t. 4. f. 1.

93. **PAPILIO MACHAON**, Linn.; Gray, *l. c.* t. 3. f. 1.

94. **PAPILIO ERITHONIUS**, Cram. Pap. Exot. t. 232. f. A, B.

95. **PAPILIO CLOANTHUS**, Westw. Arc. Ent. p. 42, t. 11. f. 2.

96. **PAPILIO SARPEDON**, Linn.; Cram. t. 122. f. D, E.

97. **PAPILIO DISSIMILIS**, Linn.; Cram. t. 82. f. C, D.

98. **PAPILIO PAMMON**, Linn.; Cram. t. 141. f. B.

99. **PAPILIO POLYCTOR**, Boisd., Jacq. Voy. Ins. t. 1. f. 1, 2.

100. **PAPILIO PROTENOR**, Cram. t. 49. f. A, B.

101. **PAPILIO PHILOXENUS**, Gray, Ins. Nepal, t. 2.

Fam. HESPERIDÆ.

102. **TAGIADES MENAKA**, Moore, P. Z. S. 1865, p. 778.

103. Pyrgus cashmirensis, n. sp. (Plate XLIII. fig. 7.)

Upperside dark fuliginous black; body and base of wings with grey hairs; cilia broad, alternate white and black: fore wing wi irregular transverse discal series of eight small white spots, a streak at end of the cell and two narrow streaks above it: hind with three scarcely visible pale narrow discal streaks.

Underside greyish brown, tinged with ochreous: fore wing spots as above; costa greyish white: hind wing with anterior abdominal margins grey; a white triangular subbasal spot, a transverse anterior discal patch with a small contiguous pos spot, and a submarginal irregular series of spots.

Exp. 1$\frac{2}{10}$ inch.

Hab. Cashmere.

DESCRIPTION OF PLATE XLIII.

Fig. 1. *Callerebia daksha*, p. 266.
2. *Limenitis hydaspes* ♂, p. 270.
3. *Pararge cashmirensis* ♂, p. 265.
4. *Argynnis cashmirensis* ♂, p. 267.
5. *Melitæa balbita* ♂, p. 268.

Fig. 6. *Epinephile maiza* ♂, unde p. 265.
7. *Pyrgus cashmirensis*, p. 27
8. *Symbrenthia hysudra* ♂,
9. *Symbrenthia asthala* ♂, p

4. List of the Diurnal Lepidoptera of the South-Sea Isla

By A. G. Butler, F.L.S., F.Z.S., &c.

[Received March 30, 1874.]

(Plate XLIV.)

Mr. W. Wykeham Perry (H.M.S. 'Pearl') has recently home a small collection of Butterflies recently taken by himse the South Seas. Of the seven species taken by him, two pro be new; and as we have other unnamed Butterflies from the region in the collection of the British Museum, I have thoug would be useful to draw up the following list, with descriptio the new species.

Family Nymphalidæ.

Subfamily Danainæ, Bates.

Genus Danais, Latreille.

1. Danais shenkii.

Danais shenkii, Koch, Indo-Austr. Lep. Fauna, p. 107 (186

New Caledonia (*Koch*).

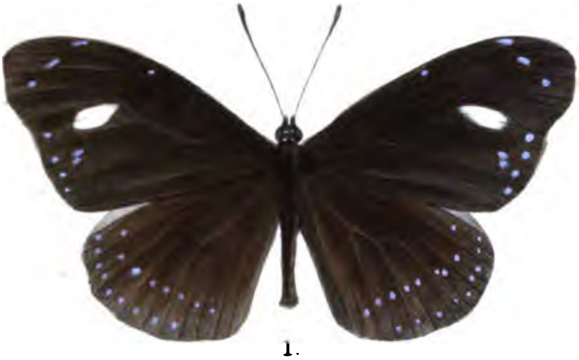
Somewhat like *D. pumila*.

2. Danais pumila.

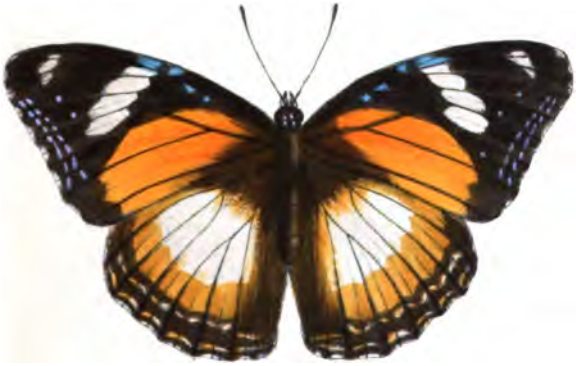
Danais pumila, Boisduval, Bull. Ent. Soc. France, p. 156. (1859).

Danais mariana, Butler, Ann. & Mag. Nat. Hist. ser. 3, vol. p. 397 (1865); P. Z. S. pl. 4. fig. 6 (1866).

New Caledonia.



1.



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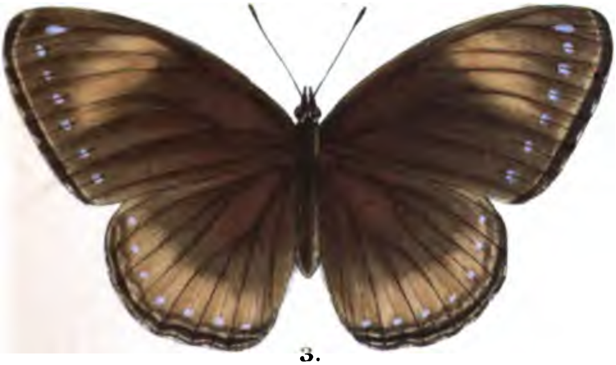

3.

R Mintern del. et lith.

Mintern Bros. imp.

1. EUPLŒA PERRYI.
2. DIADEMA PULCHRA.
3. DIADEMA LUTESCENS.

3. **DANAIS INSOLATA.**

Danais insolata, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. v. p. 360. n. 2 (1870); Cruise of the Curaçoa, p. 468, pl. 48. figs. 1, 2 (1873).

South-Sea Islands (*Brenchley*). Type, B.M.

4. **DANAIS OBSCURATA**, n. sp.

Danais melissa, Butler (nec Cramer), Ann. & Mag. Nat. Hist. ser. 4, vol. v. p. 360, n. 3 (1870).

Euplœa hamata?, Montrouzier (nec M'Leay), Ann. Sc. Phys. Nat. Lyon, p. 404 (1856).

♂. Closely allied to *D. australis*, but larger, the spots more distinctly separated, narrower and less green * ; secondaries red-brown, the inner series of submarginal spots terminating before second subcostal branch, the first series only represented by three dots at anal angle; basal two thirds of primaries below with ground-colour bright red-brown, instead of black-brown. Expanse of wings 3 inches 10 lines.

Upolu (*Brenchley*). Type, B.M.

Two specimens of this species were taken by Mr. Brenchley; the wings were closed when I originally examined them, which occasioned my mistake as to the species.

5. **DANAIS MELITTULA.**

Danais melittula, Herrich-Schäffer, Stett. ent. Zeit. p. 70. n. 8 (1869).

Upolu (*Herrich-Schäffer*); Upolu (*W. Wykeham Perry*). B.M.

The description of this species is very poor; it would be better described as a small representative of *D. hamata*, M'Leay (*D. australis* of Boisduval).

6. **DANAIS NEPTUNIA.**

Danais neptunia, Felder, Reise der Novara, Lep. ii. p. 349. n. 489, pl. 43. fig. 1 (1867).

Fiji (*Felder*); Fiji. B.M.

I found one specimen of this well-marked species in the supplementary drawers of the Banksian cabinet.

7. **DANAIS ARCHIPPUS.**

Papilio archippus, Fabricius, Ent. Syst. iii. p. 49, n. 151 (1793).

♂, South Seas (*Brenchley*); ♂, Tutuila Isl.; ♀, Upolu (*W. W. Perry*). B.M.

Genus EUPLŒA, Fabricius.

8. **EUPLŒA OROPE.**

Euplœa orope, Boisduval, Voy. de l'Astrolabe, Lép. p. 100. n. 12 (1832); Sp. Gén. i. pl. 11. fig. 9 (1836).

"Taiti" (*Boisd.*); Timor (*Wallace*). B.M.

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* In the figure of *D. australis* the spots are represented as creamy white; but in all the examples that I have seen they are as green as in *D. leonora*.

9. EUPLŒA ELEUTHO.

Danais eleutho, Quoy & Gaimard in Freycinet (1825).

? *Euploea transfixa*, Montrouzier, Ann. Sc. p. 404 (1856).

South Seas (*Brenchley*).

Montrouzier describes his species as very lik Cramer (a [illegible])!

10. EUPLŒA TRISTIS.

Euploea tristis, Butler, P. Z. S. p. 284. n. 48 (1 Aneiteum (*Cuming*).

11. EUPLŒA GRAEFFIANA.

Euploea graeffiana, Herrich-Schäffer, Stett. ent. pl. ii. fig. 3 (Jan.–Mar. 1869).

Vanua Valava (*Herrich-Schäffer*).

Nearly allied to *E. iphianassa*. *E. rumphii* of F as by Herrich-Schäffer as coming also from Vanu species, however, is at present unknown to science, described.

12. EUPLŒA IPHIANASSA.

Euploea iphianassa, Butler, P. Z. S. p. 287. n. 57, (1866).

Euploea macleayii, Felder, Reise der Novara, Le n. 436 (1867 ?).

Euploea [illegible]*, Montrouzier, Ann. Sc. Phys. Nat. (1856), but not of Boisduval.

Fiji (*Felder*); Aneiteum (*Cuming*).

This is probably the species referred to by Herric *E.* [illegible] Hübner, and as from Vanua Valava.

13. EUPLŒA FORSTERI.

Euploea forsteri, Felder, Reise der Novara, Lep. ii. p. (? 1867).

Fiji (*Felder*).

Allied to *E.* [illegible], Boisduval*, and more distantly It may be the *E. adyte* of Boisduval.

14. EUPLŒA ADYTE.

Euploea adyte, Boisduval, Bull. Ent. Soc. France, p. (1859).

New Caledonia (*Boisduval*).

15. EUPLŒA SERIATA.

Euploea seriata, Herrich-Schäffer, Stett. ent. Zeit. p (Jan.–Mar. 1869).

Vanua Valava (*Herrich-Schäffer*).

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* Bull. Ent. Soc. France, p. xlvi. n. 5, obs. (1859) = *E.* [illegible], G Cramer).

16. EUPLŒA INCOMPTA.

Euplœa incompta, Herrich-Schäffer, Stett. ent. Zeit. p. 69. no. 2 (Jan.–Mar. 1869).
Vanua Valava (*Herrich-Schäffer*).
Allied to the preceding species.

17. EUPLŒA IMITATA.

Euplœa imitata, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. v. p. 359, n. 8 (1870); Cruise of the Curaçoa, p. 466, pl. 47. figs. 1, 2 (1873).
South-Sea Islands (*Brenchley*). Type, B.M.

18. EUPLŒA LORENZO.

Euplœa lorenzo, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. v. p. 357. n. 7 (1870); Cruise of the Curaçoa, p. 466, pl. 47. figs. 3, 4 (1873).
South-Sea Islands (*Brenchley*). Type, B.M.

19. EUPLŒA JESSICA.

Euplœa jessica, Butler, Lep. Exot. p. 20, pl. viii. fig. 3 (1870).
Fiji (*Whitely*). Type, Coll. Druce.

20. EUPLŒA TREITSCHKEI.

Euplœa treitschkei, Boisduval, Voy. de l'Astrolabe, Lép. p. 98. n. 9 (1832); Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 11. fig. 2 (1847).
New Ireland (*Parzudaki*) B.M.

21. EUPLŒA SCHMELTZI.

Euplœa schmeltzi, Herrich-Schäffer, Stett. ent. Zeit. p. 70. n. 4; pl. ii. fig. 8 (Jan.–Mar. 1869).
Upolu (*Brenchley*). B.M.

22. EUPLŒA VITELLA.

Euplœa vitella? (Cramer), Montrouzier, Ann. Sc. Phys. Nat. Lyon, p. 403 (1856).
Woodlark Island (*Montrouzier*).

Appears to be allied to *E. melina*, and certainly is not the *Papilio vitellia* of Cramer (which is a *Dyctis*), as evidenced by the description:—"Wings black, paler at the extremity; underside of upper wings marked upon the costa by three points and a bifid streak, all white, and at the sides by a border of points; underside of lower wings spotted with white: upon the wings of the male a band of dull black." This last sentence proves it to be a true *Euplœa*.

23. EUPLŒA LAPEYROUSEI.

Euplœa lapeyrousei, Boisduval, Voy. de l'Astrolabe, p. 97. n. 7. (1832).
Aneiteum (*Macgillivray*). B.M.

It is just possible that this may not be Boisduval's species, as the type was said to come from Bouru; the present species was also labelled *E. paykullei* in Mr. Saunders's collection.

24. EUPLŒA BRENCHLEYI.

Euplœa brenchleyi, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. v. p. 357. n. 2 (1870); Cruise of the Curaçoa, p. 464, pl. 46 (1873).
South-Sea Islands (*Brenchley*). Type B.M.

25. EUPLŒA ESCHSCHOLTZII.

Euplœa eschscholtzii, Felder, Reise der Nov., Lep. ii. p. 345. n. 480 (1867?); Herrich-Schäffer, Stett. ent. Zeit. xxx. pl. 2. fig. 9 (Jan.–Mar. 1869).
Fiji Islands; Aneiteum (*Cuming*). B.M.
Herrich-Schäffer figures a very small example of this species.

26. EUPLŒA HELCITA.

Euplœa helcita, Boisduval, Bull. Soc. Ent. France, p. 156 (1859).
Euplœa montrouzieri, Felder, Reise der Nov., Lep. ii. p. 345. n. 479 (1867?).
New Caledonia (*Macgillivray*). B.M.
Scarcely differs from the preceding species.

27. EUPLŒA DISTINCTA, n. sp.

Euplœa eleutho, var., ♀, Herrich-Schäffer, Stett. ent. Zeit. xxx. pl. 2. fig. 7 (Jan.–Mar. 1869).
Hab. ——?

28. EUPLŒA PROSERPINA.

Euplœa proserpina, Butler, P. Z. S. p. 300. n. 90 (1866).
Euplœa herrichii, Felder, Reise der Novara, Lep. ii. p. 344. n. 477, tab. xxxix. figs. 3, 4 (? 1867).
Fiji. Type, B.M.

29. EUPLŒA PERRYI, n. sp. (Plate XLIV. fig. 1.)

♂. Allied to *E. eschscholtzii*; primaries more elongated; all the white spots smaller; central spot of postmedian oblique series subpyriform, diffused internally; subanal spot absent; wings below paler; primaries with all the spots well defined; the second of oblique postmedian series pyriform, notched in front; no subanal spot; only five submarginal points; the three or four lilacine spots at end of discoidal cell absent; secondaries with one minute lilacine point between subcostal branches, the others all absent; the submarginal series of creamy white points wider apart; expanse of wings 3 inches 3 lines.
Nieue or Savage Island, 4th Nov. 1873 (*W. Wykeham Perry*). B.M.

Nearly allied to, but clearly distinct from, *E. helcita* and *E. eschscholtzii*.

Subfamily SATYRINÆ, Bates.

Genus MELANITIS, Fabricius.

30. **MELANITIS LEDA, var. TAITENSIS.**

Cyllo leda, var. *taitensis*, Felder, Verhandl. zool.-bot. Gesellsch. in Wien, xii. (1862); var. 22, Butler, Ann. & Mag. xix. (1867).

Papilio leda, Cramer, Pap. Exot. iv. pl. 292. fig. A (1782).

Tahiti (*Felder*); South-Sea Islands (*Macgillivray*). B.M.

31. **MELANITIS LEDA, var. SOLANDRA.**

Papilio solandra, Fabricius, Syst. Ent. p. 500 (1775).

Cyllo solandra, Boisduval, Voy. dans l'Océanie, Ent. pt. 1, p. 142 (1832–35).

Cyllo helena, Westwood, in Gen. Diurn. Lepid. p. 361. n. 2 (1851); Butler, Ann. & Mag. 3rd ser. xix. vars. 1*a*, 2*b*, 5*b*, 19*a*, 20*a* (1867).

? *Cyllo fulvescens*, Felder, Reise der Novara, Lep. iii. p. 465. n. 788 (1867).

Ovalau and Vanua Valava (*H.-Schäffer*); Tutuila Isl. (*Perry*). B.M.

Subgenus HIPIO, Hübner.

32. **MELANITIS AMABILIS.**

Cyllo amabilis, Boisduval, Voy. de l'Astrolabe, Ent. pt. i. p. 140, pl. 2. figs. 1, 2 (1832).

New Ireland (*Boisduval*)

Genus XOIS, Hewitson.

33. **XOIS SESARA.**

Xois sesara, Hewitson, Trans. Ent. Soc. 3rd ser. ii. pt. 4, p. 282, pl. 17. figs. 3, 4 (1865).

Acrophthalmia? *diophthalma*, Prittwitz, Stett. ent. Zeit. p. 274. n. 31 (1867).

Viti Levu and Ovalau (*Herrich-Schäffer*); Fiji (*Macgillivray & Brenchley*). B.M.

Subfamily MORPHINÆ, Butler.

Genus TENARIS, Hübner.

34. **TENARIS CATOPS.**

Drusilla catops, Westwood, Gen. Diurn. Lepid. p. 335. n. 3, note (1851); Trans. Ent. Soc. ser. 2. vol. iv. p. 181 (1858).

New Ireland (*Westwood*); Aru (*Wallace*). B.M.

I rather doubt the identity of examples from New Ireland and Aru.

35. **TENARIS PHORCAS.**

Drusilla phorcas, Westwood, Trans. Ent. Soc. ser. 2. vol. iv. p. 182, pl. 21. fig. 1 (1858).

New Hebrides? (*Macgillivray*). Type, B.M.

36. **TENARIS MYLŒCHA.**

Drusilla mylœcha, Westwood, ser. 2. vol. i. n. 5, p. 175 (1851);

Trans. Ent. Soc. ser. 2. vol. iv. p. 182 (1858); White, Voy. Rattlesnake, App. p. 390, pl. 4. figs. 3, 4 (1852).

Louisiade Islands (*Macgillivray*). Type B.M.

37. TENARIS ANABLEPS.

Drusilla anableps, Vollenhoven, Tijd. voor Ent. iii. p. 40, pl. 1. fig. 3, pl. 2. fig. 1 (1860).

Otaheite (*Vollenhoven*).

Very close to *T. phorcas*, but paler in colour, with the ocellus of secondaries above larger and margined externally by a dusky border.

Subfamily NYMPHALINÆ, Bates.

Genus DOLESCHALLIA, Felder.

38. DOLESCHALLIA BISALTIDE?

Nymphalis polibete (Godart), Montrouzier, Ann. Sc. Phys. Nat. Lyon, p. 403 (1856).

Doleschallia bisaltide (Cramer), Herrich-Schäffer, Stett. ent. Zeit. p. 71. n. 10 (1869).

Woodlark (*Montrouzier*); Ovalau and Vanua Valava (*Herrich-Schäffer*).

I think it doubtful whether this is the *P. bisaltide* of Cramer. M. Montrouzier remarks that the black spots on the secondaries are blue-pupilled; and Dr. Herrich-Schäffer notices the absence of any silver spots on the under surface.

Genus CHARAXES, Ochsenheimer.

39. CHARAXES CAPHONTIS.

Charaxes caphontis, Hewitson, Ex. Butt. iii., *Char.* pl. 3. figs. 14, 15 (1863).

Fiji (*Hewitson*).

Genus NEPTIS, Fabricius.

40. NEPTIS VENILIA?

Limenitis venilia (Godart), Montrouzier, Ann. Sc. Phys. Nat. Lyon, p. 406 (1856).

Woodlark (*Montrouzier*).

I think it doubtful whether this is the *P. venilia* of Linnæus; there seem to be at least three distinct forms, all of which will have to be separated. We have the typical form from Amboina, Ceram, Mysol, and Waigiou.

41. NEPTIS? WOODLARKIANA.

Limenitis woodlarkiana, Montrouzier, An. Sc. Phys. Nat. Lyon, p. 406 (1856).

Neptis woodlarkiana, Kirby, Cat. Diurn. Lep. p. 242. n. 52 (1871).

Woodlark (*Montrouzier*).

Genus Junonia, Hübner.

42. Junonia villida.

Papilio villida, Fabricius, Mant. Ins. p. 35. n. 366 (1787).

Papilio velleda, Fabricius, Ent. Syst. iii. p. 91. n. 283 (1793); Donovan, Ins. New Holland, pl. 25. fig. 3 (1805).

Vanua Valava and Ovalau (*Herrich-Schäffer*); Navigators' Islands. B.M.

Genus Diadema, Boisduval.

43. Diadema nerina.

♀. *Papilio nerina*, Fabricius, Syst. Ent. p. 509. n. 277 (1775); Donovan, Ins. New Holl. pl. 27. fig. 1 (1805).

♀. *Papilio iphigenia*, Cramer, Pap. Exot. i. pl. 67. figs. D, E (1779).

♂. *Diadema lassinassa*, Montrouzier (nec *lisianassa*, Cramer), Ann. Sc. Phys. Nat. Lyon, p. 406 (1856).

Woodlark Island (*Montrouzier*); Australia. B.M.

We have this insect (♀) also in the collection made by Dr. Horsfield in Java; it scarcely differs at all from the Australasian type.

44. Diadema otaheitæ.

Diadema auge, Cram., var. *otaheitæ*, Felder, Verh. zool.-bot. Ges. xii. p. 492. n. 185 (1862).

Taiti (*Felder*).

Evidently allied to the preceding, but considerably smaller.

45. Diadema pulchra, n. sp. (Plate XLIV. fig. 2.)

♀. Primaries above black-brown; the interno-median area to second median branch tawny; three or four oblique central subcostal pale blue dashes; an oblique quadrifid white fasciole beyond the cell; a trifid subapical spot and four discal internervular dots, all white; a double submarginal series of geminate whitish dots, not reaching the apex or anal angle; secondaries with base and outer margin broadly dark brown; central area tawny orange, crossed by a broad angulated white belt; a double submarginal series of geminate subochraceous spots; nervures dusky, lilacine on the white band; body olivaceous brown; head and prothorax spotted with whitish; wings below nearly as in *D. nerina*, but the white band of secondaries broader. Expanse 3 inches 2 lines.

New Caledonia (*Macgillivray*). Type, B.M.

Allied to *D. manilia*, Cramer, ♀ of *D. lisianassa*, and reminds one of *Danais alcippus*; it is a small species.

46. Diadema montrouzieri, n. sp.

♂. *Diadema lassinassa*, Montrouzier (nec *P. lisianassa*, Cramer), Ann. Sc. Phys. Nat. Lyon, p. 408 (1856).

♀. Similar above to *D. proserpina*, Cramer *, excepting that it is larger, that the apical area of primaries is tawny ochraceous, that there is no tawny spot on interno-median area, and that the central spot of secondaries is smaller and always more or less shot with purplish blue; wings below similar to *D. manilia*, Cr., but the submarginal spots tinted with pale ochre. Expanse 4 inches 1 line.

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* A variety of *D. nerina*, Fabr. (♀ of *D. auge*, Cramer).

Navigators' Islands. Type, B.M.

47. DIADEMA PALLESCENS, n. sp.

♂ ♀. *Diademà bolina*, Butler (nec Linnæus), Ann. & Mag. Nat. Hist. ser. 4, vol. v. p. 360 (1870); ♀. Cruise of the Curaçoa, p. 468, pl. 48. figs. 3, 4 (1873).

Solomon Islands (*Brenchley*). Type, B.M.

Hitherto the whole of the *Diademæ* of the *Bolina* group have been looked upon as varieties of one species; but having gone carefully over them with Mr. Frederic Moore, I have come to the conclusion that there are several distinct and well-marked species. Our examples represent the following species:—

1. *Diadema bolina*, Linn. (Clerck's Icones).
Silhet, Nepal, Moulmein, Ceylon. ♂ ♀. Coll. B.M.

2. *Diadema jacintha*, Drury, = *D. avia*, Fabr.
N. India, Moulmein, Ceylon. ♂ ♀. Coll. B.M.

3. *Diadema* n. sp.? ♀ (? var. of next sp.).
Borneo. Coll. B.M.

4. *Diadema philippensis*, Butler.
Philippines. ♂ ♀. Coll. B.M.

5. *Diadema*, n. sp.
India, E. India. ♂, ♀. Coll. B.M.

6. *Diadema*, n. sp.?
Celebes. ♂. Coll. B.M.

7. *Diadema alcmene*, Cramer.
Java, Australia. ♂ ♀. Coll. B.M.

8. *Diadema nerina*, Fabr., = *D. auge*, Cramer, = *D. proserpina* (var.).
Java, Australia. ♂ ♀. Coll. B.M.

9. *Diadema lisianassa*, Cramer, = *D. manilia*, Cramer.
Ceram. ♂ ♀. Coll. B.M.

10. *Diadema pulchra*, Butler.
New Caledonia. ♀. Coll. B.M.

11. *Diadema pallescens*, Butler.
Solomon Islands. ♀. Coll. B.M.

12. *Diadema montrouzieri*, Butler.
Navigators' Islands. ♂ ♀. Coll. B.M.

13. *Diadema*, n. sp.
? Tasmania. ♂ ♀. Coll. B.M.
This last species approaches *D. diomea* of Hewitson in character.

48. **DIADEMA OCTOCULA.**

♀. *Diadema octocula*, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. iii. p. 19. n. 5, pl. 9. fig. 5 (Jan. 1, 1869), vol. vii. p. 447 (1871).

♂. ?*Diadema formosa*, Herrich-Schäffer, Stett. ent. Zeit. p. 71. n. 16, pl. 4. fig. 17 (Jan.–March 1869).

Totoya, Fiji (*Butler*); Vanua Valava (*Herrich-Schäffer*).

W. F. Kirby, in the 'Zool. Record' for 1871, states that if my *D. octocula* is = *D. formosa*, the latter specific name will take priority. Upon what grounds he comes to this conclusion I am unable to imagine; for it must be manifest to every reasoning being that the Jan.–March number of the 'Stettiner Zeitung' can only have been procurable on the 1st of April at the earliest, whereas my paper appeared on the 1st of January.

49. **DIADEMA LUTESCENS**, n. sp. (Plate XLIV. fig. 3.)

♀. Wings above chestnut-brown, becoming smoky brown towards the middle; primaries with apical third and marginal area dirty buff; a broad postmedian oblique paler buff band; seven distinct rounded discal internervular white spots; outer margin black-brown, edged internally at intervals with white scales; secondaries with external third pale buff; seven diffused discal internervular white spots; outer margin broadly dusky, narrowly black, intersected by two interrupted undulated pearly white lines; fringe varied with white; body brown; head and prothorax blackish, white-spotted: wings below paler than above; basal two thirds smoky instead of chestnut-brown; apical third of primaries clearer, marginal whitish scalings defined, forming two submarginal lines as on secondaries; basal half of costa irrorated with white scales, three black-bordered white subcostal spots within cell; eight discal white spots in secondaries; body brown, white-spotted; palpi below white. Expanse of wings 3 inches 4 lines.

Ovalau, Fiji (*W. Wykeham Perry*). Type, B.M.

Allied to *D. porphyria* of Cramer.

Genus CETHOSIA, Fabricius.

50. **CETHOSIA OBSCURA.**

Cethosia obscura, Guérin, Voy. Coq. pl. 15. fig. 4 (1829); Boisduval, Voy. de l'Astrolabe, Lép. p. 111 (1832).

New Ireland.

Genus ATELLA, E. Doubleday.

51. **ATELLA GABERTI.**

Argynnis gaberti, Guérin, Voy. Coq. pl. 16. fig. 3 (1829).

Melitæa gaberti, Boisduval, Voy. de l'Astrolabe, Lép. p. 116 (1832).

Taiti (*Guérin*). B.M.

52. **ATELLA BODENIA.**

Atella bodenia, M. R. Butler, P. Z. S. p. 687 (1873).

? *Atella egista*, Herrich-Schäffer (nec Cramer), Stett. ent. Zeit. p. 71. n. 17 (1869).

Friendly Islands. B.M.

Herrich-Schäffer's specimens were received from Upolu.

Genus Cynthia, Fabricius.

53. Cynthia, sp.?

♂. *Vanessa arsinoe*, Montrouzier (nec Cramer), Ann. Sc. Phys. Nat. Lyon, p. 405 (1856).

♀. *Vanessa juliana*, Montrouzier (nec Cramer), *loc. cit.* (1856).

Woodlark Island (*Montrouzier*).

This species is not likely to be *C. arsinoe*, as that species appears to be strictly limited to Amboina and Ceram: it is probably more nearly allied to *C. ada* (P. Z. S. 1873).

Genus Pyrameis, Hübner.

54. Pyrameis tammeamea.

Vanessa tammeamea, Eschscholtz, Kotzeb. Reise, iii. p. 207, pl. 5. figs. 8, *a*, *b* (1821).

Pyrameis cordelia, Doubleday & Hewitson, Gen. Diurn. Lep. pl. 25. fig. 3 (1837).

Sandwich Islands. B.M.

Family Erycinidæ.

Subfamily Libytheinæ, Bates.

Genus Libythea, Fabricius.

55. Libythea antipoda.

Libythea antipoda, Boisduval, Bull. Soc. Ent. France, p. clvii. n. 9 (1859); Felder, Reise der Novara, Lep. ii. p. 313. n. 423, pl. 42. figs. 9, 10 (1867?).

New Caledonia (*Boisduval*); Philippines (*Felder*). B. M.

I think it quite likely (since Mr. Wallace found characters by which to separate the representatives of this species in Ceram and Batchian) that the New-Caledonian and Philippine insects are perfectly distinct.

Family Lycænidæ.

Subfamily Lycæninæ, Butler.

Genus Lampides, Hübner.

56. Lampides caledonica.

Lycæna kandarpa, var. *caledonica*, Felder, Verh. zool.-bot. Ges. xii. p. 495. n. 209 (1862).

New Caledonia (*Felder*).

57. Lampides taitensis.

Lycæna taitensis, Boisduval, Voy. de l'Astrolabe, Lép. p. 771. n. 1 (1832).

Taiti (*Boisduval*), Australia. B.M.

58. LAMPIDES CYTA.

Catochrysops cyta, Boisduval, Voy. de l'Astrolabe, Lép. p. 87 (1832).

New Ireland (*Boisduval*).

59. LAMPIDES ARGENTINA.

Lycæna argentina, Prittwitz, Stett. ent. Zeit. p. 274. n. 32 (1867).

Acrophthalmia? *argentina*, Kirby, Cat. Diurn. Lep. p. 96. n. 4 (1871).

Samoa (*Prittwitz*) ; sp. ead.? Aneiteum. ♂, B.M.

Closely allied to, if not identical with *L. macrophthalma* of Felder.

60. LAMPIDES SAMOA.

Lycæna samoa, Herrich-Schäffer, Stett. ent. Zeit. p. 73. n. 30 (1869).

Samoa (*Herrich-Schäffer*).

Probably the same as the preceding, but so carelessly described (both sexes being described as females) that I cannot identify it with certainty.

61. LAMPIDES CANDRENA.

Lycæna candrena, Herrich-Schäffer, Stett. ent. Zeit. p. 74. n. 34 (1869).

Viti Levu, Ovalau, Vanua Valava (*Herrich-Schäffer*).

We have a species apparently allied to the above from the Navigators' Islands; but the description mentions no black margin to the wings of the male, and gives hardly any idea of the under surface, so that I dare not refer our insect to this species.

62. LAMPIDES DYOPA.

Lycæna dyopa, Herrich-Schäffer, Stett. ent. Zeit. p. 75. n. 35 (1869).

Ovalau (*Herrich-Schäffer*).

Probably a variety of the preceding, from which apparently it differs very little.

Genus LYCÆNA, Fabricius.

63. LYCÆNA PHŒBE.

Lycæna phœbe, Murray, Ent. Mo. Mag. p. 107 (1873).

New Caledonia (*Macgillivray*) ; Tutuila Isl. (*Perry*). B.M.

64. LYCÆNA ALSULUS.

Lycæna alsulus, Herrich-Schäffer, Stett. ent. Zeit. p. 75. n. 36 (Jan.-Mar. 1869).

Upolu (*Herrich-Schäffer*).

Kirby quotes *L. communis*, H..Sch. (an undescribed species from Vanua Valava), under *L. lysimon* of Hübner.

65. LYCÆNA? CLEOTAS.

Lycæna cleotas, Guérin, Voy. de la Coq. pl. 18. fig. 4 (1829).
Argus poeta, Boisduval, Voy. de l'Astrolabe, Lép. p. 90 (1832).
New Ireland (*Guérin*).

66. LYCÆNA? CATOCHLORIS.

Lycæna? catochloris, Boisduval, Voy. de l'Astrolabe, Lép. p. 78. n. 3 (1832).
Taiti (*Boisduval*).
I suspect that this is a *Danis*.

Subfamily THECLINÆ, Butler.

Genus AMBLYPODIA, Horsfield.

67. AMBLYPODIA MEANDER?

Arhopala meander, Montrouzier (? Boisd.), Ann. Sc. Phys. Nat. Lyon, p. 403 (1856).
Woodlark Island (*Montrouzier*).

68. AMBLYPODIA PHRYXUS?

Arhopala pryxus (sic), Montrouzier (? *phryxus*, Boisd.), Ann. Sc. Phys. Nat. Lyon, p. 403 (1856).
Woodlark Island (*Montrouzier*).

Family PAPILIONIDÆ.

Subfamily PIERINÆ, Bates.

Genus DELIAS, Hübner.

69. DELIAS BAGOË.

Pieris bagoë, Boisduval, Voy. de l'Astrolabe, Lép. p. 49. n. 1 (1832); Wallace, Trans. Ent. Soc. ser. 3, vol. iv. p. 355. n. 36, pl. 7. figs. 3, 3 *a* (1867).
New Ireland (*Boisduval*).

Genus ELODINA, Felder.

70. ELODINA SIGNATA.

Elodina signata, Wallace, Trans. Ent. Soc. London, ser. 3, vol. iv. p. 319. n 8 (1867).
New Caledonia (*Macgillivray*). Type, B.M.

Genus TERIAS, Swainson.

71. TERIAS HECABE.

Papilio hecabe, Linnæus, Syst. Nat. ii. p. 763. n. 96 (1766).
Terias hecabe, Herrich-Schäffer, Stett. ent. Zeit. p. 77. n. 53 (1869).
Vanua Valava (*Herrich-Schäffer*); Australia. B.M.

Genus Colias, Fabricius.

72. **Colias ponteni.**

Colias ponteni, Wallengren, Wien. ent. Monatschr. iv. p. 33: n. 1 (1860); Eug. Reise, p. 351 (1871).
Sandwich Islands (*Wallengren*).

Genus Catopsilia, Hübner.

73. **Catopsilia lactea.**

Callidryas lactea, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. v. p. 361 (1870); Lep. Exot. p. 43, pl. 16. figs. 5–7 (1870); Cruise of the Curaçoa, p. 470, pl. 49. figs. 1, 2 (1873).
Solomon Islands (*Brenchley*). Type, B.M.

74. **Catopsilia gorgophone.**

Callidryas gorgophone, Boisduval, Sp. Gén. Lép. i. p. 632. n. 26 (1836); Butler, Lep. Exot. p. 30. n. 4, pl. 12. figs. 1–4 (1870).
Vanua Valava, Ovalau (*Herrich-Schäffer*); Australia. B.M.

Genus Appias, Hübner.

75. **Appias psyche.**

Pieris psyche, Felder, Reise der Novara, Lep. ii. p. 166. n. 143 (1867?).
New Caledonia (*Felder*).

76. **Appias ega**, var. (Boisd.).

Pieris melania, var. *caledonica*, Felder, Verh. zool.-botan. Ges. xii. p. 495. n. 207 (1862).
? *Pieris albina*, var. *galathea*, Herrich-Schäffer, Stett. ent. Zeit. p. 76. n. 42 (1869).
New Caledonia (*Macgillivray*). B.M.
A. galathea of Felder occurs at Sambelong, *A. albina* in the Philippines.

77. **Appias amarella.**

Tachyris amarella, Wallace, Trans. Ent. Soc. London, ser. 3, vol. iv. p. 373. n. 25, pl. 9. fig. 2 (1867).
New Caledonia (*Macgillivray*). Type. B.M.

78. **Appias acrisa.**

Pieris acrisa, Boisduval, Bull. Soc. Ent. France, p. 156 (1859).
Woodlark Island (*Boisduval*).

79. **Appias athama.**

Pieris athama, Lucas, Rev. Zool. p. 336 (1852); Blanchard, Voy. Pôle Sud, p. 381, pl. 1. figs. 10, 11 (1853).
Vanua Valava (*Herrich-Schäffer*); New Caledonia (*Macgillivray*). B.M.

80. **Appias eumelis.**

Pieris eumelis, Boisduval, Voy. de l'Astrolabe, Lép. p. 50. n. 8 (1832).
New Ireland (*Boisduval*).

81. **Appias libythea.**

♀. *Papilio libythea*, Fabricius, Syst. Ent. p. 471. n. 120 (1775).
♂. *Pieris jacquinotii*, Lucas, Rev. Zool. p. 326 (1852).
New Caledonia (*Lucas*); Ceylon, &c. B.M.

Genus Belenois, Hübner.

82. **Belenois nabis (B. scyllaria, var.).**

Pieris nabis, Lucas, Rev. Zool. p. 326 (1852).
Fiji (*Lucas*); Australia. B.M.

83. **Belenois periclea.**

Pieris periclea, Felder, Reise der Novara, Lep. ii. p. 169. n. 151 (1867?); Herrich-Schäffer, Stett. ent. Zeit. p. 76. n. 45, pl. 1. fig. 4 (1869).
Aneiteum (*Cuming*). B.M.

84. **Belenois peristhene.**

Pieris peristhene, Boisduval, Bull. Soc. Ent. France, p. 155. n. 4 (1859).
New Caledonia (*Macgillivray*); New Ireland (*Parzudaki*); Aneiteum (*Cuming*). B.M.

Subfamily Papilioninæ, Bates.

Genus Ornithoptera, Boisduval.

85. **Ornithoptera boisduvalii.**

Ornithoptera boisduvalii, Montrouzier, Ann. Sc. Phys. Nat. Lyon, p. 394 (1856).
Papilio oceanus, Felder, Verh. zool.-bot. Ges. Wien, xiv. p. 290. n. 13, p. 332. n. 10 (1864).
Woodlark Island (*Montrouzier*).

86. **Ornithoptera urvilliana.**

♂. *Papilio urvillianus*, Guérin, Voy. Coq. pl. 13. figs. 1, 2 (1829).
Ornithoptera urvilliana, Boisduval, Sp. Gén. Lép. i. p. 175. n. 2, pl. 17. fig. 1 (1836).
New Ireland (*Guérin*); ? ♀, Lizard Island. B.M.

I think it just possible that the ? variety of *O. cassandra*, which I have mentioned in the 'Cruise of the Curaçoa,' may be the female of this species; it is very similar in outline.

87. **Ornithoptera poseidon.**

♂. *Ornithoptera poseidon*, Doubleday, Ann. & Mag. Nat. Hist. xix. p. 173 (1847); Westwood, Cab. Or. Ent. pl. 11 (1848).

♀. *Papilio euphorion*, G. R. Gray, Cat. Lep. Ins. Brit. Mus. i. p. 4. n. 6, pl. 2. fig. 3 (1852).

Darnley Island, N.E. Australia. B.M.

There can be no question that the above are sexes of one species; it should perhaps, strictly speaking, hardly find a place in this list.

88. ORNITHOPTERA VICTORIÆ.

♀. *Ornithoptera victoriæ*, G. R. Gray, P. Z. S. p. 7, pl. 39 (1856).

"S. Pacific Ocean" (*G. R. Gray*). Type, B.M.

Mr. Gray remarks respecting the locality, that, from the insects sent in the same box with this species, it "is supposed (as no memorandum was sent with it) to be either Solomon Islands, Aneiteum, New Hebrides, or the Fiji group." Some lepidopterists have supposed that *O. victoriæ* might be the female of *O. tithonus* of De Haan from Papua.

Genus PAPILIO, Linnæus.

89. PAPILIO HYPSICLES.

Papilio hypsicles, Hewitson, Ex. Butt. iv. *Pap.* pl. 9. fig. 29 (1868).

Aneiteum (*Cuming*). B.M.

Closely allied to *P. canopus* of Westwood.

90. PAPILIO GODEFROYI.

♂ ♀. *Papilio godefroyi*, Semper, Trans. Ent. Soc. ser. 3. vol. ii. p. 469, pl. 24 (1866).

Upolu (*Semper*); Ovalau (*Herrich-Schäffer*); ♀, Upolu (*W. W. Perry*). B.M.

This handsome and rare Butterfly comes near *P. capaneus*, which is probably the "? *P. severus*" of Montrouzier.

91. PAPILIO DUNALI.

♂. *Papilio dunali*, Montrouzier, Ann. Sc. Phys. Nat. Lyon, p. 396 (1856).

Woodlark Island (*Montrouzier*).

Montrouzier also mentions *P. ormenus*, Boisd., as common at Woodlark Island; but this is very unlikely; he may refer to *P. erectheus*.

92. PAPILIO SCHMELTZI.

Papilio schmeltzi, Herrich-Schäffer, Stett. ent. Zeit. p. 78. n. 57, pl. 1. fig. 1 (1869).

Ovalau (*Herrich-Schäffer*).

Nearly allied to *P. godefroyi*.

93. PAPILIO AMYNTHOR.

Papilio amynthor, Boisduval, Bull. Soc. Ent. France, p. clv. n. 3 (1859).

New Caledonia (*Boisduval*).

According to Dr. Boisduval, allied to *P. ilioneus* (figured by

Donovan); much smaller, the tail short; the spot of the lower wings of a different form, not entering the anterior wings; no red marginal spots; under the red-brown anal spot one or two crescents of greyish atoms.

94. Papilio godartii.

Papilio godartii, Montrouzier, Ann. Sc. Phys. Nat. Lyon, p. 398 (1856).

Woodlark Island (*Montrouzier*).

Referred, with doubt, by Kirby to the *P. onesimus* of Hewitson; it cannot be that species. M. Montrouzier describes it as a male, but the colour-characters appear to me to be rather those of a female.

95. Papilio chaudoiri.

Papilio chaudoiri, Felder, Wien. ent. Monatschr. iv. p. 99. n. 53, pl. 2. fig. 1 (March 1860).

Papilio ulyssinus, Westwood, Proc. Ent. Soc. ser. 2, vol. v. p. 73 (May 1860).

New Caledonia (*Macgillivray*). ♂. B.M.

96. Papilio telemachus.

Papilio telemachus, Montrouzier, Ann. Sc. Phys. Nat. Lyon, p. 401 (1856).

Woodlark Island (*Montrouzier*).

Seems only to differ from *P. chaudoiri* in having six instead of four silky black patches on the external area of primaries above.

97. Papilio montrouzieri.

Papilio montrouzieri, Boisduval, Bull. Soc. Ent. France, p. 158 (1859); Felder, Reise der Nov. Lep. i. p. 118. n. 88 (1865).

New Caledonia (*Macgillivray*). ♂, B.M.

98. Papilio codrus?

Papilio codrus, Montrouzier (? Cramer), Ann. Sc. Phys. Nat. Lyon, p. 402 (1856).

Woodlark Island (*Montrouzier*).

99. Papilio gelon.

Papilio gelon, Boisduval, Bull. Soc. Ent. France, p. 155 (1859).

New Caledonia (*Boisduval*).

100. Papilio sarpedon?

Papilio sarpedon, Linnæus, Mus. Lud. Ulr. p. 196 (1764).

"Sandwich Islands (*Beechy*)." B.M.

I rather doubt the above locality, as we have examples not differing in the least from the single specimen ("var. *c*," G. R. Gray) from Japan. It barely differs from the typical form.

101. Papilio agamemnon.

Papilio ægistus, Cramer, Pap. Exot. ii. pl. 106. figs. C, D (1779)

"Woodlark Island" (*Montrouzier*).

I suspect that Montrouzier's insect is a distinct species.

Family Hesperiidæ.

Genus Hesperia, Fabricius.

102. Hesperia exclamationis.

Papilio (*P. U.*) *exclamationis*, Fabricius, Syst. Ent. p. 530. n. 373 (1775).

Hesperia exclamationis, Butler, Cat. Diurn. Lep. Fabr. p. 269. n. 1, pl. 3. fig. 2 (1869).

Aneiteum (*Cuming*). B.M.

103. Hesperia dirpha.

Thymele dirpha, Boisduval, Voy. de l'Astrolabe, Lép. p. 162. n. 8 (1832).

New Ireland (*Boisduval*).

Genus Pamphila, Fabricius.

104. Pamphila angustula.

Pamphila angustula, Herrich-Schaffer, Stett. ent. Zeit. p. 79. n. 19 (1869).

Vanua Valava (*Herrich-Schäffer*).

In the 5th Catalogue of the Museum Godeffroy, pp. 58, 59, *Pieris* (*Belenois*) *teutonia* is reported as occurring in Viti Island, *Pieris* (*Appias*) *ada* in the island of Yap, Pelew Islands, and *Callidryas* (*Catopsilia*) *minna* in Ovalau. I suspect the first of these three to be *B. peristhene*, and the third *C. lactea*; "*A. ada*" of the list is probably distinct from the typical form, which we have only from Aru.

In my list of the Lepidoptera collected in the South-Sea Islands by Mr. Brenchley, I have included *Acræa andromacha*; I think it likely, however, that the single example in the collection was taken on the Australian coast.

EXPLANATION OF PLATE XLIV.

Fig. 1. *Euplœa perryi*, p. 278.
2. *Diadema pulchra*, p. 281.
3. *Diadema lutescens*, p. 283.

5. Remarks on the Grey-capped Gulls and on the Species with which they have been confounded. By Howard Saunders, F.Z.S.

[Received March 31, 1874.]

In anticipation of a Monograph of the *Laridæ*, upon which I have for some time been engaged, I offer a few remarks with the object of clearing up the confusion which exists respecting the

Grey-capped Gulls for which Bonaparte formed the subgenus *Cirrhocephalus* (Naumannia, 1854, Heft iv. p. 213).

There are two closely allied species, which during the breeding-season, and, as I believe, throughout a considerable portion of the year, bear a hood of a pale French grey, slightly darker at the margins, round the nape and throat, viz. :—

LARUS PHÆOCEPHALUS, Sw. B. W. Afr. ii. p. 245, pl. 29 (originally written *L. poiocephalus*), a native of West Africa and the interior up to Lake Ngami; and

LARUS CIRRHOCEPHALUS, Vieillot, N. D. xxi. p. 500; Gal. Ois. ii. p. 223, pl. 289; the *Gaviota cenicienta* of Azara, found in Brazil and the States of La Plata.

In their general appearance these Gulls closely resemble each other; and both Blasius and Schlegel have considered them to be identical—an opinion the value of which is somewhat impaired by the fact of their having confounded one or both of these species with others from which they are most certainly distinct. This has doubtless arisen from the want of a sufficient series in which the localities have been duly recorded; for specimens of the birds in question, and of those with which they have been confounded, are extremely rare in collections; and it is only recently that I have been able to obtain such a series as would justify my speaking with some confidence on the subject.

First, as regards the distinctness of the African and the American forms, I have before me the following specimens:—

LARUS PHÆOCEPHALUS.

Senegambia, Swainson's coll., Cambridge Mus. Believed to be the type: ad.

Walvisch Bay (*Andersson*), probably in October. Ad.; full hood.

Lake Ngami (*Chapman*, May 1863). Hood slightly imperfect.

Wing 12·5, tar. 1·8–2, middle toe and nail 1·7, bill 1·4. Colour of legs and bill orange-red.

LARUS CIRRHOCEPHALUS.

Buenos Ayres, ♂ & ♀ ad., several specimens, those killed in April and November having the grey cap equally defined; also immature specimens obtained in April, and in which the grey hood is appearing, although the dark bar to the tail and the brown feathers on the shoulders still remain.

♀. Chorillos, near Lima, lat. 12° 10′ S.; the first recorded instance of its occurrence on the Pacific coast. This was shot by a friend resident at Lima, whom I had asked to collect Gulls &c.

Wing 13–13·5, tar. 2·2–2·4, middle toe and nail 2, bill 6·1. Bill legs, and feet lake-red; in a very old male of the brightest crimson.

The same description would apply to either: the hood pale grey with a dark margin; the wings and mantle rather darker than the hood, but much lighter than the *under wing-coverts*, which are of a *deep smoke-grey*; underparts and tail pure white. But it will be observed that there is a considerable difference both in the size and in the coloration of the soft parts of the two species; and this is much more noticeable on handling the different specimens than can be gathered from any mere description. It must be admitted that Swainson in his original description states that the bill and feet of the African bird are "deep crimson;" but, with every allowance for fading, I cannot imagine the colour in those I have examined to have ever been more than "orange-red," very different from the livid red or brilliant lake-colour of the American specimens. Of course I am now alluding to adults only; but, as regards size, a glance at the coarser and stronger feet even in the immature American birds would enable me to distinguish them from the African form. Without, however, insisting too strongly upon the value of these differences, I consider that the two forms are at least as much entitled to specific distinction as *L. glaucus* and *L. leucopterus*, or *L. marinus* and *L. fuscus*, to say nothing of the species which surround *L. argentatus*. This conclusion is in no way influenced by the fact of the two species being found in different continents; for I am at the present moment unable to separate the Saddle-backed Gulls which, under the titles of *L. dominicanus, vetula*, and *antipodum*, with other synonyms, inhabit both the Atlantic and Pacific coasts of South America, the south coast of Africa, New Zealand, and many of the intervening islands. It would seem that these Grey-capped Gulls are representative species on either side of the South Atlantic, in the same way that *L. heermanni* on the west coast of America replaces *L. crassirostris*, Vieill. (*L. melanurus*, Temm.), in the Japan and China seas—not to quote other instances which are not quite so evident.

But the question of the distinctness of these two forms is a mere trifle to the maze of confusion in which both these and two totally different species have been involved, and which I will do my best to unravel. To do this it will be better to take them separately.

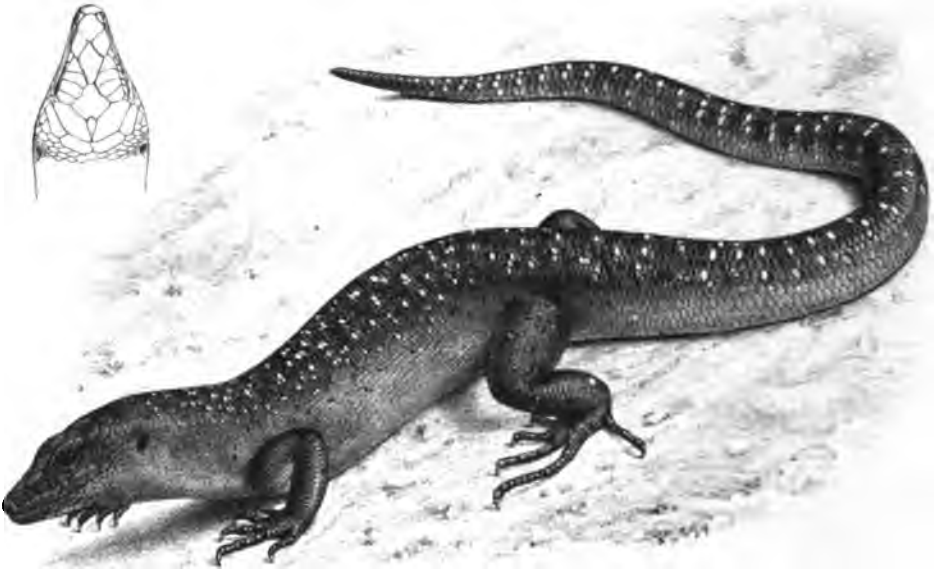
L. phæocephalus is identified by Bruch (J. f. O. 1855, p. 290) with *L. ridibundus*; but he could never have seen a true specimen. Finsch and Hartlaub (Vög. Ost.-Afr. p. 825) describe the real bird from Bissao with a grey head, but are probably wrong as regards the specimen with a white head from the Cape of Good Hope, received through Verreaux. Blasius again (J. f. O. 1865, p. 376) may possibly have had a specimen of the Grey-capped Gull in immature plumage before him; but he goes on to confound it with *L. hartlaubi*, Bruch, a species which that author places in his genus *Gavia*, close to *Gelastes*. This latter species has a certain superficial resemblance to the former, and it also has the under wing-coverts of a smoke-grey; but it is altogether a smaller bird than *L. phæocephalus*, the wing being only 11 inches and the tarsus 1·7 in length; besides which, it *never* has a *hood*. It is a coast resident, and breeds near the Cape of Good Hope; it is, in fact, a member of the same group as *L. scopulinus*, Forst., of New Zealand, *L. novæ hollandiæ*, *L.*

jamesoni, and perhaps *L. pomare*, into whose specific distinctness it is not my present intention to enter. Another point which distinguishes it from *L. phæocephalus* exists in the seventh primary, which has a broad dusky bar right across it and is altogether darker in the grey-capped bird, whilst in *L. hartlaubi* it is uniform grey, just fringed with smoke-colour on the inner web; the colour of the legs and bill is also deep lake-red. Blasius says (*loc. cit.*) that, as a rule, *L. phæocephalus*, Sw., figures as *L. hartlaubi* in collections; but according to my experience the reverse is the case; and, with one solitary exception in the British Museum, all the specimens which I have examined marked "*L. phæocephalus*" are really *L. hartlaubi*. Layard (B. S. A. p. 368) has also confounded these two species, having obtained both.

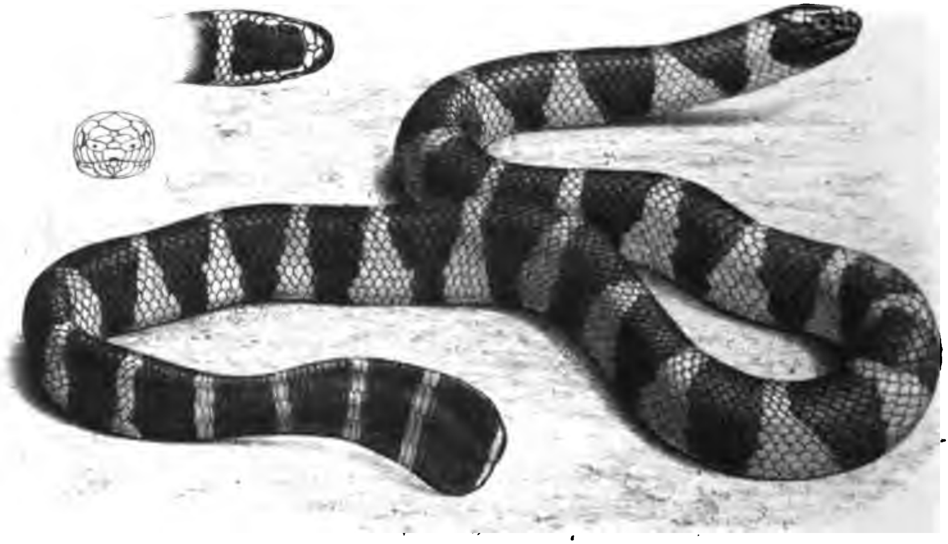
When we turn to *L. cirrhocephalus* of South America we find a different element of confusion, owing to the presence there of a species which certainly has a hood, although in this case it is a brown one, similar to that of our European *L. ridibundus*. Prince Max. v. Wied first noticed its occurrence amongst the grey-capped species (Beit. iv. p. 854), and was inclined to refer it to *L. ridibundus*; but it is undoubtedly *L. glaucodes*, Meyen, Obs. Zool. p. 115—*L. albipennis*, Licht., *Gavia roseiventris*, Gould (I only give the principal synonyms)—a species which ranges from the south of Brazil down to the Falkland Islands, throughout Patagonia, and for some distance up the coast of Chili. This is the species of whose breeding near Buenos Ayres Mr. W. H. Hudson (P. Z. S. 1871, p. 4) has given an interesting account; but although he distinctly calls it (P. Z. S. 1870, p. 802, and 1871, p. 258) the *black*-headed gull, the very name we apply to our *L. ridibundus*, yet he identifies it with *L. cirrhocephalus*, whose head, as I have repeatedly remarked, is of a pale grey, and nothing approaching either to black or brown. Excepting that to a casual observer all Gulls of nearly the same size are much alike, it is difficult to understand how the two species can have been confounded even in immature plumage; for the smoke-colour of the under wing-coverts so noticeable in *L. cirrhocephalus* is entirely absent in *L. glaucodes*, to say nothing of the markings of the primaries, which differ even in very young birds. That *L. glaucodes* itself should have been subdivided is not at all surprising; for it requires a large series to show how the primaries, which in the early stages have merely a patch of white near the apex, gradually become barred with black and white (in which stage the brown head of maturity is assumed) and gradually lose all but a streak of black on the outside of the inner web, so that the principal primaries appear to be entirely white. *L. maculipennis* of Burmeister, however, is *L. cirrhocephalus*.

The sum of my observations is briefly this—that *L. phæocephalus*, Sw., and *L. cirrhocephalus*, V., are fairly separable, that *L. phæocephalus* is totally distinct from *L. hartlaubi*, Bruch, which never has a hood of any colour whatever, and that *L. cirrhocephalus* has been unnecessarily confounded with *L. glaucodes*. My warmest

A.



B.



G H Ford

Mintern Bros imp

A. MABOUIA LAWESII.
B. PLATURUS SCHISTORHYNCHUS.

thanks are due to Professor Burmeister, of Buenos Ayres, for promptly furnishing me with sexed and dated specimens of both the South-American species, and to Professor Newton for the loan of Swainson's (supposed) type of *L. phæocephalus* from the Cambridge Museum.

6. A Contribution to the Fauna of Savage Island.

By Dr. A. Günther, V.P.Z.S.

[Received April 1, 1874.]

(Plate XLV.)

Professor Rolleston, F.R.S., has submitted to my examination a small collection of animals made at Niue or Savage Island, a locality rarely touched by vessels, and then for a very short time only. Of the more recent accounts of visitors to the island, I refer especially to the two following:—T. H. Hood, 'Notes of a Cruise in H.M.S. 'Fawn' in the Western Pacific in the year 1862' (Edinb. 1863, 8vo), pp. 9–27; and J. L. Brenchley, 'Jottings during the Cruise of H.M.S. 'Curaçoa' among the South-Sea Islands in 1865' (Lond. 1873, 8vo), pp. 16–35. The island is about 40 miles in circumference, an upraised coral plateau, nearly of an equal elevation, about 250 feet above the level of the sea in its highest part. Vegetation is abundant and varied; and some portions of the island are well wooded. The notes of the two authors mentioned are of a rather general character as far as the fauna is concerned. Hood states (p. 25):—"The fauna and flora are on a limited scale, and similar to those of the larger islands to the north-west. Doves and Pigeons abound; and the large cocoa-nut-eating Crab (*Birgus latro*) is very common and highly esteemed as an article of food by the natives." Brenchley mentions "a great Bat" which he saw flying at a remarkable height, "one indigenous mammifer, a small rodent of a size between a water-rat and a mouse," "a few birds, among them pigeons or doves of a green colour, parrots, a pretty little green bird with white feathers under the tail, a small martin or swallow," "a great number of pretty little lizards, some handsome butterflies, a large species of spider, and a grasshopper, three species of small land-shells."

The isolated position of the island, which is distant four degrees of longitude from the nearest point of the Tonga group, and five of latitude from the Navigator's Islands, renders its fauna and flora objects of particular interest; and I have no doubt that Prof. Rolleston and his correspondent, the Rev. Mr. Lawes, will be encouraged by the result of the examination of the present small collection to obtain a complete set of the indigenous animals and plants.

The only mammal in the collection is a small species of *Pteropus*. It appears to be identical with the species figured by Quoy and Gaimard in the 'Voyage of the Astrolabe' under the name of *Pt. tonganus*. Coloration, size, and habitat seem to point to identity with this species, the typical specimens of which had been collected in Tongatabu. But the dentition of our example does not agree with the figure given by the French naturalists, which, however, does not seem to be sufficiently accurate for the purpose of specific identification. Peters places *Pt. tonganus* as a doubtful synonym under *Pteropus keraudrenii*. As I shall have before long well authenticated examples of the latter for comparison, I shall, perhaps, be able to throw more light on this problematical species.

Of Reptiles the following were in the collection :—

1. Ablepharus pœcilopleurus, Wiegm.

It appears to me that recent authors (more especially Strauch in his monograph of this genus) have confounded two species under the names *A. boutonii* and *A. peronii*.

In the Mauritian species, for which the name *boutonii* must be retained, the posterior frontals are scarcely in contact with each other, the vertical almost touching the præfrontal. In specimens from Australia, the islands of the Pacific, and eastern portion of the Indian Ocean, the posterior frontals form together a broad suture, as has been already represented by Wiegmann and Coctean. The oldest name for this form is *Ablepharus pœcilopleurus*, Wiegm. I have been able to convince myself of the constancy of this character, having examined 10 specimens from the Mauritius, and, of the Pacific species, 5 examples from the Sandwich Islands, 2 from Savage Island, 1 from Aneiteum, 4 from North Australia, 16 from Western Australia, and 3 from Timor*.

2. Gehyra oceanica, Less.

3. Mabouia baudinii, D. & B.

This appears to be the most common species of the island, the late Mr. Brenchley having collected numerous examples. Other localities from which we have received this species are New Guinea and San Christoval (Solomon Islands).

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* I append here the description of another new species in the British Museum:—

ABLEPHARUS QUINQUETÆNIATUS.

This species belongs to the division *Cryptoblepharus*, and is allied to *C. pœcilopleurus*, but may be readily recognized by its coloration. The upper and lateral parts are deep black, with five well-defined narrow white lines—one along the median line of the back, one from each superciliary along the side of the back, the outermost from the infraocular through the tympanum to the loin. On the tail the median line has disappeared, and the others are continued as zigzag lines or series of spots. Lower parts greenish.

The eye is surrounded by a complete circle of granules; postfrontals united by a broad suture; central occipital confluent with anterior occipitals. Dorsal scales very broad, in four series. Body surrounded by 24 series of scales; 63 scales in a longitudinal series between chin and vent. Two large præanal scales. Toes very slender.

Two specimens (of the ordinary size of a *C. pœcilopleurus*, and perfectly alike in every respect) were presented to the British Museum by Capt. Parry, and are said to be from the west coast of Africa.

4. **Mabouia lawesii**, sp. n. (Plate XLV. fig. A.)

Supranasals far apart; postfrontals separated by the vertical, which is produced forward into a point touching the præfrontal. Only one anterior occipital. Ear-opening without lobules. Scales very small, the body being surrounded by 55 series of scales, and there being 78 scales in a longitudinal series between the axil of the fore leg and the vent. Nine præanal scales subequal in size. The fore leg, when laid forward, reaches to the nostril. The upper parts are brown, gradually passing into the greenish white of the lower parts. Small dark-brown specks are scattered over the back and sides; but most characteristic are yellowish white spots (each occupying one scale only) with which the back of the body and tail are ornamented. On the trunk they are irregularly distributed, but on the tail they are arranged in more or less regular transverse series.

	in.	lin.
Distance of the snout from the ear........	0	9
,, ,, fore leg....	1	3
,, ,, vent......	3	6
Length of tail........................	6	0
Total length..........................	9	6
Length of fore leg....................	1	2

I have named this fine species after the Rev. Mr. Lawes, who has been engaged in improving the condition of the inhabitants of this island since the year 1861.

5. **Platurus schistorhynchus**, sp. n. (Plate XLV. fig. B.)

The rostral shield is transversely divided into two, the upper portion forming an azygos shield between the nasals. Another azygos shield between the posterior frontals. Scales of the front part of the trunk in twenty-one longitudinal series. Ventral shields from 190 to 199. Snout and side of the head black, separated from the black crown of the head by a horseshoe-shaped yellow band which sometimes joins the yellow ring round the neck. Body surrounded by about twenty-two black rings, broader than the interspaces.

I have examined five examples of this species, all agreeing in the peculiarity of the divided rostral combined with the black snout. This snake appears to be common on the shores of Savage Island, as Mr. Lawes states that it is constantly caught and handled by children and that it never attempts to bite. The discovery of this snake is another instance of the local occurrence of many species of sea-snakes. The figure is of the natural size.

A small Scorpion preserved in the same bottles with the Reptiles is, as Mr. Butler informs me, *Ischnurus complanatus* (Koch).

7. Contributions to a General History of the *Spongiadæ*.

By J. S. Bowerbank, LL.D., F.R.S., &c.—Part VI.

[Received April 4, 1874.]

(Plates XLVI. & XLVII.)

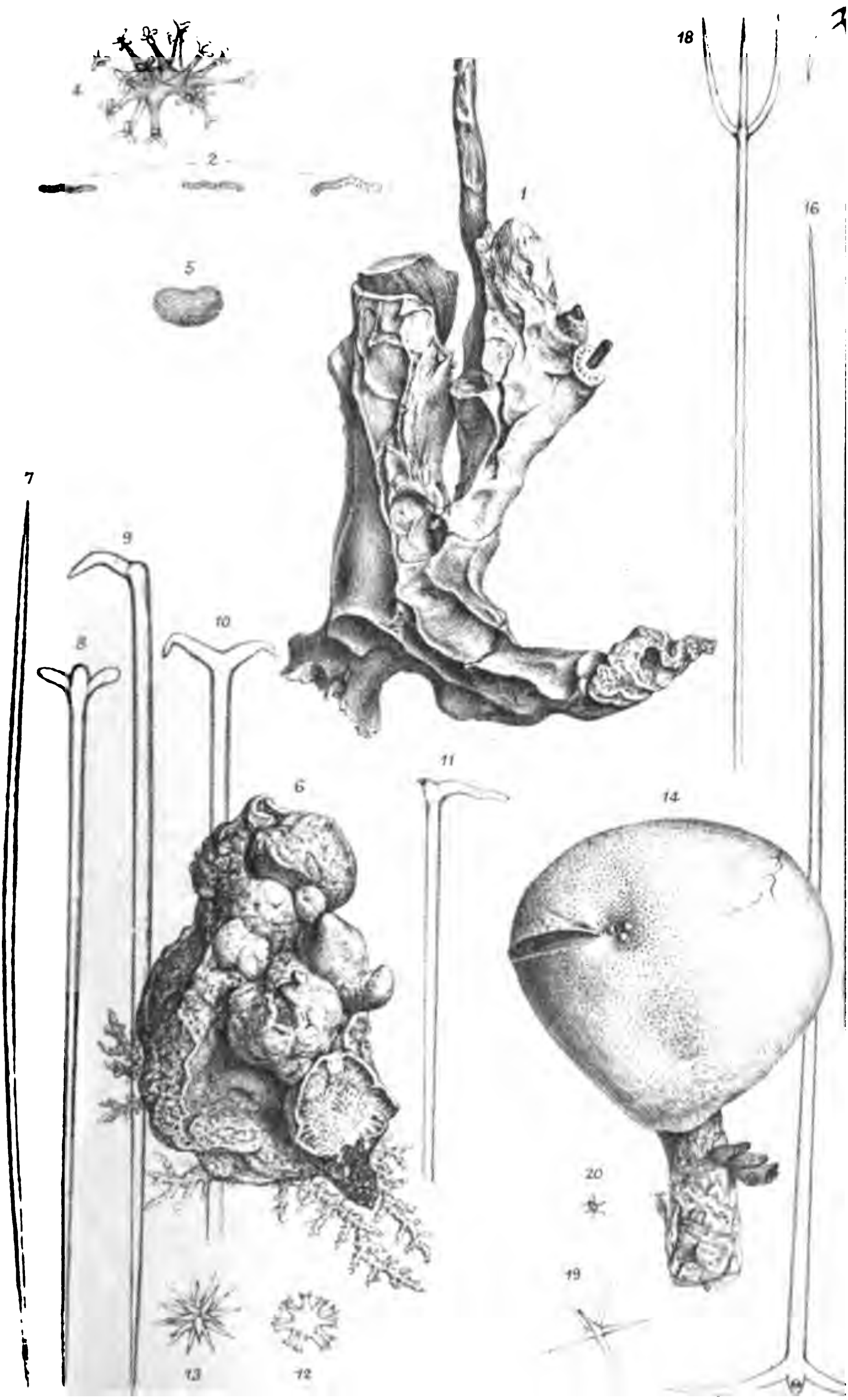
Geodia carinata, Bowerbank. (Plate XLVI. figs. 1–5.)

Sponge sessile, coating stems of *Gorgonia* or Fuci. Surface smooth, but furnished with numerous longitudinal carinæ. Oscula simple, dispersed, few in number. Pores inconspicuous. Dermal membrane thin and pellucid, furnished abundantly with multiangulated cylindrical spicula. Skeleton—fasciculi multispiculous, compact; spicula attenuato-spinulate, bases coincident. Interstitial membranes furnished abundantly with arborescent elongo-subsphero-stellate retentive spicula, variable in degree of development. Ovaria oval or kidney-shaped, component spicula slender and delicate. Surface-rete very minute.

Colour in the dried state light fawn-yellow.
Hab. South Sea (*Mr. Thos. Ingall*).
Examined in the dried state.

I received the figured specimen of this singular species from my late friend Mr. Thos. Ingall in 1854, and I then described and named it in MS.; and subsequently the multiangulated cylindrical spicula of the dermis were described and figured in my paper on the "Anatomy and Physiology of the *Spongiadæ*," in the Philosophical Transactions of the Royal Society for 1858, p. 314, plate xxvi. fig. 10, and also the arborescent elongo-subsphero-stellate retentive spicula of the interstitial membranes in p. 308, plate xxv. fig. 19 of the same part for 1858. Shortly after I had examined and named the species I saw a similar specimen in the British Museum arranged among the Corals; and I stated to Dr. Baird that it was a sponge and told him the name I had assigned to it, and he forthwith removed it from the case and placed it among the Sponges. Subsequently I obtained a second specimen by purchase in the year 1864. The whole three specimens were similarly parasitical and very closely resembled each other in their external characters, and especially so in their singularly carinated striation. On taking sections at right angles to the surface of the sponge, I found that these elevated ridges were produced by the projection of lines of skeleton-fasciculi through the dermal crust of the sponge to immediately beneath the dermal membrane, but in no instance did they appear to perforate that organ. The greater portion of these carinated elevations were in a longitudinal direction; but occasionally short transverse ridges are found connecting the longitudinal ones with each other.

The dermal membrane is thin and pellucid, and when in a fine state of preservation it is literally crowded with innumerable minute

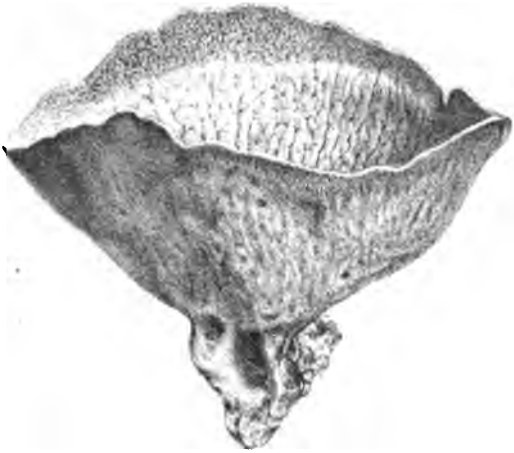


W Lens Aldous del. et lith

W. We

1–5, Geodia carinata. 6–13, G. imperfecta. 14–20, G. reticul

3



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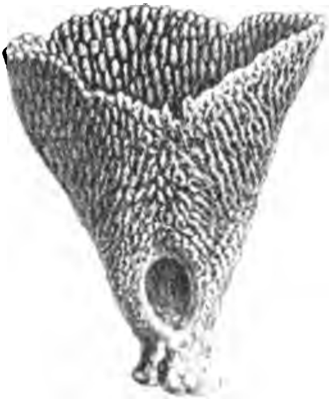

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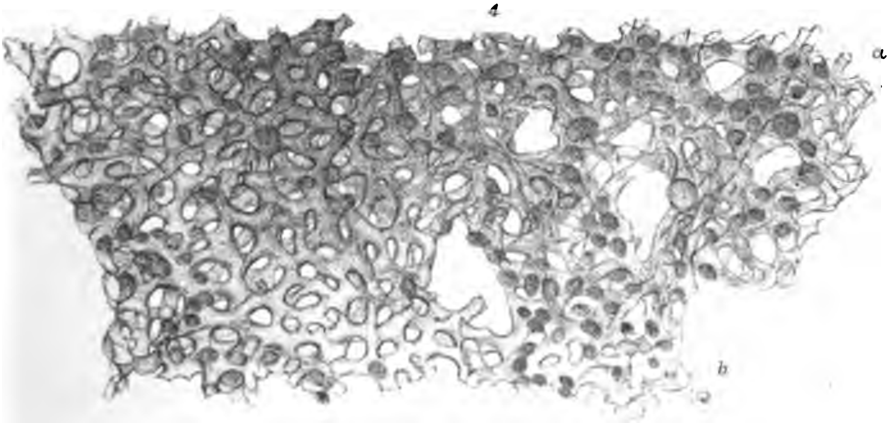

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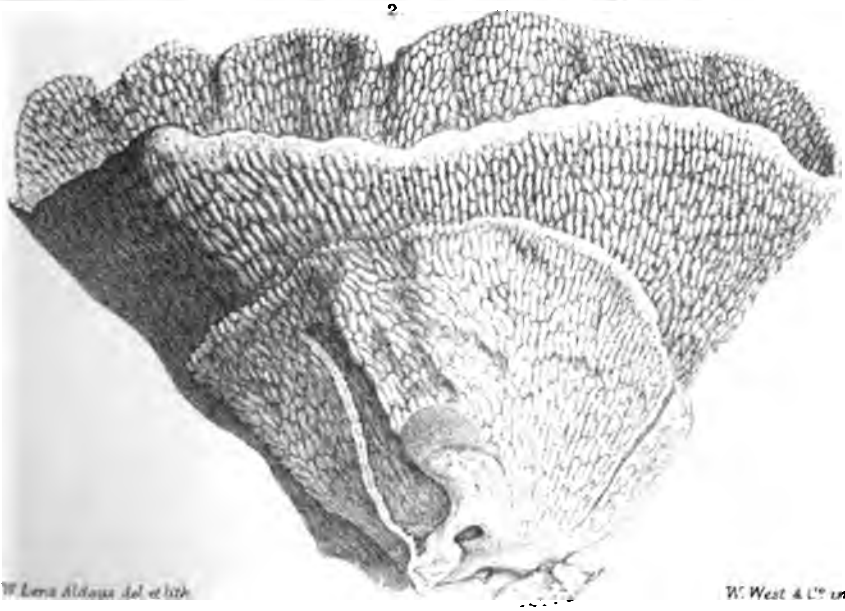

W. Lens Aldous del. et lith.
W. West & Co imp.

1–2. Halispongia Ventriculoides. 3–4, H. Mantelli.

multiangulated cylindrical retentive spicula; they are so minute as to require a power of five or six hundred linear to render their forms distinctly to the eye. The number of angles in these spicula vary from two or three to six or seven; and in some cases the angulation is very distinctly and regularly produced.

From the thin coating nature of the sponge the skeleton-arrangement is not so readily demonstrable as in many other species of the genus. The fasciculi are abundantly spiculous and very compactly constructed. The bases of the spicula are all coincident and proximal, while all the apices are distal as regards the direction of the fasciculi.

The interstitial membranes are in many parts literally crowded with the arborescent elongo-subsphero-stellate retentive spicula, and they are also dispersed in considerable quantities amongst the ovaria in the dermal crust. These spicula are singular and very characteristic organs. The specimen figured is a very fully developed one. They vary in degree of development to a very considerable extent; and in some the central mass is very thin and elongate.

In the dermal crust of the sponge none but fully developed ovaria are to be found; but they are dispersed in considerable numbers on all parts of the interstitial membranes, and in every stage of development from an elongately oval loosely aggregated mass of very minute spicula to the compact and fully matured organ. The spiculous structure of these ovaria is very much finer and more minute than in any other species of *Geodia* with which I am acquainted.

GEODIA IMPERFECTA, Bowerbank. (Plate XLVI. figs. 6–13.)

Sponge massive, tuberous, sessile. Surface smooth. Oscula simple, minute, dispersed. Pores inconspicuous. Dermal membrane unknown. Skeleton—fasciculi rather loosely constructed; spicula subfusiformi-acerate, rather stout and short. Connecting spicula attenuato-patento-ternate; radii rarely perfectly developed, distal terminations recurved, not very numerous. Interstitial membranes—retentive spicula sphero-stellate with cylindro-subfoliate radii, numerous; and attenuato-stellate, variable in form, occasionally subsphero-stellate more or less. Ovaria oval, depressed.

Colour in the dried state cream-white.
Hab. South sea.
Examined in the dried state.

I obtained four specimens of this species from a dealer in objects of natural history; they are each attached to the basal portion of a specimen of *Oculina rosea* from the South Sea; the figured specimen is the largest of the four. The whole of them possess the same description of tuberous massive form; the smallest two did not exceed an inch in length by about half an inch in breadth. The oscula are so small as to require the aid of a lens of two inches focus to render them readily apparent. I could not find any remains of the dermal membrane on either of the specimens. The connecting-spicula afford the most prominent specific characters of the species. The normal form is that of a regular attenuato-expando-ternate connecting spiculum, the three radii of which are as nearly as possible equal; but they are very rarely found in this state. Sometimes one or two of the terminal radii are absent or only partially developed, or one or more of them terminate hemispherically. If the radii are completely produced, their apices are mostly recurved or they assume various contortions. If I had had the type specimen only for examination, I might have imagined that these malformations and contortions of the radii were those of the individual only; but I carefully examined microscopically the other three specimens to see whether their spicula agreed in the imperfect development of the radii of the ternate connecting ones of the type specimen; and I found in all of them the same contorted or undeveloped condition of their radii that forms so striking a character in the type one.

The interstitial membranes are abundantly furnished with the two forms of stellate retentive spicula, which, from their structural peculiarities, afford very efficient specific characters. The sphero-stellate ones with cylindro-subfoliate radii are rather the more numerous of the two forms: they do not differ to any great extent in their diameter; a perfectly developed one measured extreme diameter $\frac{1}{1818}$ inch. The attenuato-stellate ones vary considerably in their amount of development; many of them have comparatively a small number of radii, and in such cases they are frequently subsphero-stellate: but this does not appear in the fully developed forms, where the radii are too numerous to be counted; a large one of this description measured extreme diameter $\frac{1}{1900}$ inch.

The ovaria are more or less oval and are depressed to a considerable extent; their length is frequently nearly twice that of their diameter. They are abundantly dispersed on the surfaces of the interstitial membranes, and may be seen in every stage of development, from a minute multistellate form to that of the adult ovarium.

GEODIA RETICULATA, Bowerbank. (Plate XLVI. figs. 14–20.)

Sponge massive, sessile. Surface smooth, minutely reticulated. Oscula small, congregated irregularly. Pores inconspicuous, evenly dispersed. Dermal membrane unknown. Skeleton—fasciculi compact, abundantly spiculous; spicula fusiformi-acerate, rather slender; connecting spicula attenuato-patento-ternate, stout and long, numerous, radii moderately long; and recurvo-ternate long and rather slender, numerous; also, rarely, porrecto-ternate long and slender. Interstitial membranes—tension-spicula fusiformi-acerate small and slender, often flexuous; retentive spicula attenuato-stellate very numerous, radii few; also cylindro-stellate, exceedingly abundant and very minute, radii rather numerous. Ovaria small, spherical, rather numerous.

Colour in the dried state cream-white.

Hab. Mexico (*Mr. Thos. Ingall*).

Examined in the dried state.

I received this sponge from my late friend Mr. Thos. Ingall, labelled "Mexico." It is firmly based on the remains of the stem of a fucus. The surface, to the unassisted eye, has a minutely reticulated appearance, arising from the closely disposed and exceedingly numerous porous depressions; but in the living state it would most probably be quite smooth. The oscula were congregated in an irregular group near the basal attachment; they are simple in structure and very small, the largest of them scarcely a line in diameter. The internal structure is remarkable for the abundant varieties of its spicula. The skeleton-fasciculi are composed of numerous, somewhat slender, fusiformi-acerate spicula; and the fasciculi are very much strengthened near the surface of the sponge by the incorporation in their substance of the shafts of the numerous connecting spicula, those of the patento-ternate ones frequently being nearly twice the diameter of those of the skeleton and considerably longer; both the patento-ternate and the recurvo-ternate ones are numerous; but the porrecto-ternate forms are of rare occurrence and are frequently very slender. The interstitial membranes are abundantly supplied with the two forms of retentive spicula, and especially so with the smallest of the two forms. A fully developed one, of the largest size, measured $\frac{1}{1000}$ inch extreme diameter; and two of the smaller description were $\frac{1}{8000}$ inch and $\frac{1}{4286}$ inch in diameter; and the latter one was not the smallest one in the field of view. The radii of the largest form were always acutely terminated, while those of smaller ones were truncated or slightly expanded at their distal terminations. The retentive spicula are very characteristic of the species, from their minuteness and great abundance on the interstitial membranes; while, on the contrary, the tension-spicula are comparatively of rare occurrence.

The ovaria are abundantly dispersed on all parts of the interstitial membranes in various stages of development.

HALISPONGIA VENTRICULOIDES, Bowerbank. (Plate XLVII. figs. 1 & 2.)

Sponges from Otaheite, Ellis and Solander's Natural History of Zoophytes, p. 206, tab. 59. figs. 1, 2, 3.

Spongia otahitica, Esper, vol. ii. tab. of Sponges lxi. (copied from Ellis and Solander).

Sponge cup- or fan-shaped, thin; pedicle short and stout. Surface rather prominently ridged or mammillated in lines radiating from the base to the distal margin, ridges or mammæ more or less elongated, margin of cup thick and rounded. Dermis retiform; rete abundantly arenulous. Oscula simple, minute, dispersed, few in number. Pores inconspicuous. Skeleton—primary fibres abundantly arenulous; secondary fibres rarely arenulous.

Colour in the dried state ochreous yellow.

Hab. South Sea, Otaheite.

Examined in the dried state.

The prevailing form of this species is the cup-shaped one, subject to a considerable amount of variation. The specimen represented by fig. 2, Plate XLVII., is very regularly cup-shaped, but with the addition of a small fan-shaped offset from its base; and in a third cup-shaped one in my possession numerous thin fan-shaped ridges are projected from the outer surface, some of which are more than half an inch in height: and I have had several fan-shaped ones of very considerable dimensions: one in my possession is very little short of 14 inches in breadth; and many years since I gave a still larger one to the British Museum. A remarkable circumstance, which seems to prevail in the cup-shaped specimens, is that they all appear to have an orifice near the bottom of the cup, as represented in fig. 1, Plate XLVII.; but it does not always exhibit the same regularity; in the specimen represented by fig. 2, it is much larger and more irregular in form. The ridged or mammillated surface-structure is the same in every form or size of the species.

The dermal rete is a strong closely constructed network, so laden with particles of sand that the keratose-fibres are rarely to be distinctly seen. The oscula are situated on the mammæ or ridges of the exhalant or inner surface of the cup, and they are so minute as to be scarcely visible without the aid of a 2-inch lens.

The primary fibres of the skeleton are mostly disposed at right angles to the outer and inner surfaces of the sponge, and each fibre has usually a single closely packed series of arenaceous particles of nearly equal size; and the distal fibres of the skeleton may be frequently seen projected beyond the outer surface, each terminated with a single molecule of sand encased in a thin coat of transparent keratode. The secondary or internal connecting fibres are mostly destitute of arenaceous matters; a few short lengths of broken sponge-spicula are occasionally found embedded in them; their general line of disposition is at right angles to the primary fibres.

This species is especially interesting as exhibiting a very close alliance with Dr. Mantell's fossil species of *Ventriculites radiatus*, described and published in his work on the Geology of Sussex, p. 468, and figured in tables x., xi., xii., xiii., & xiv. of that work. The author instituted the genus *Ventriculites* for the reception of a series of fossil forms which were considered by him to be silicified *Alcyonia*; and in p. 168 he gives the following as its generic and specific characters:—

"*Generic character.*—Body inversely conical, concave, capable of contraction and expansion; original substance spongious (?) or gelatinous (?), external surface reticulated; internal surface covered with openings or perforated papillæ; base imperforated, prolonged into a stirps, and attached to other bodies.

"*Specific character.*—Infundibuliform; external integument composed of cylindrical, anastomosing fibres, radiating from the centre to the circumference; inner surface covered with perforated papillæ formed by the open extremities of short transverse tubuli; stirps fixed by radical processes."

The learned author accounts for the great variety of forms assumed by these animals as "partly attributable to the various forms of expansion and contraction in which the originals were introduced into the mineral kingdom, and partly to the mode in which their remains are occasionally preserved." With our present knowledge of the protean nature of the Spongiadæ, the great variety of forms exhibited by these fossils may be naturally and more readily accounted for than by imagining them to have possessed the power of contraction and dilatation; and the enveloping flint, which affords no indication of the form or structure of the enclosed sponge, is now known to be attributable to the ventriculite sponge having, in its living state, been covered by a parasitical species of sponge, the whole being subsequently fossilized as one body.

Specimens of Mantell's *Ventriculites radiatus* embedded in flint are by no means uncommon. If one of these exhibiting the natural surface of either the internal or external surface be immersed in a basin with water containing 10 or 12 per cent. of hydrochloric acid until the whole of the calcareous matter has been removed, and then, when dried, if it be examined by direct light with a linear power of about 50, the silicified fibrous structure will be frequently found in a beautiful state of preservation, and when compared with that of the recent sponge *Halispongia ventriculoides*, the fibrous tissues of the two are so much alike as almost to induce a belief that they belong to the same species under different circumstances.

I have two thin sections at right angles to the natural surfaces of a specimen of Mantell's *Ventriculites radiatus* from near the bottom of the cup embedded in flint; viewed by transmitted light with a power of 50 linear, they present precisely the structural characters we see in our recent *Halispongia ventriculoides*. There is the same arrangement of the fibrous structure, the primary ones abundantly arenulous; and the internal secondary ones are destitute of sand, and, what is strongly indicative of a close alliance, there are several fibres projecting from the external surface terminated by a single grain of sand as in the recent sponges; and the external surface of the fossil sponge is as abundantly arenulous as that of the recent one.

In Ellis and Solander's work there are neither generic nor specific descriptions given of the sponges figured; and Esper copies Ellis and Solander's figures and designates the specimen as *Spongia otahitica*. I do not see that this specific designation has any pretensions to stand; and I have therefore named the species *ventriculoides*, as more consistent with its ancient alliances, and as forming a bond of union with the very closely allied species of Mantell's *Ventriculites radiatus*.

HALISPONGIA MANTELLI, Bowerbank. (Plate XLVII. figs. 3 & 4.)

Sponge cup-shaped, thin; pedicel short. Surface, outer one smooth and even; inner one furnished with depressed ridges, radiating from the bottom of the cup to the distal margin; distal margin attenuated. Dermis retiform, abundantly arenulous. Oscula simple, dispersed, very minute, inconspicuous. Pores dispersed, visible by the aid of a 2-inch lens. Skeleton—primary fibres abundantly arenulous; secondary fibres rarely arenulous.

Colour light ochreous yellow.

Hab. South Seas.

Examined in the dried state.

The specimen figured is the only one that I have seen. I obtained it by purchase from a dealer, along with other sponges and specimens of *Oculina rosea* from the South Seas. The external characters of this sponge at once separate it from the nearly allied species *H. ventriculoides.* The outer surface exhibits but very faint traces of the primary radial lines of the skeleton that are so prominently exhibited in *H. ventriculoides*; and on the inner surface the radial lines are so much depressed as to be scarcely termed elevated. The retiform dermis is abundantly supplied with arenaceous particles of nearly uniform size. The oscula are nearly all obsolete; the few seen by the aid of a lens of two inches focus were minute simple orifices. The pores are readily to be seen by the aid of the lens; they are very numerous on the outer or inhalant surface of the sponge, and are equally dispersed on all parts of its surface. The primary lines of the skeleton are abundantly arenulous, the grains of sand usually forming a single series very equable in size.

The secondary skeleton-fibres rarely ever contain sand particles; but a few small fragments of siliceous spicula are occasionally seen in some of them, and they always appear to be disposed in accordance with the axis of the fibre. This species appears to be closely allied to Mantell's *Spongus Townsendi*, p. 164, tab. xvi. fig. 9, 'Geology of Sussex.' The only portion of the ventriculite sponge in Mantell's figure that is visible is the extremely thin distal margin of the sponge; and in this character it closely resembles our recent specimen. I have not been fortunate enough to meet with a good specimen of Mantell's *S. Townsendi*; but I have a portion of what is apparently one of them completely immersed in flint; and, as far as can be judged by a polished section at right angles to its surfaces, it is very similar in its structure to our recent specimen of sponge, and there is a total absence of the sinuous outline that would be exhibited by a similar section of a specimen of Mantell's *Ventriculites radiatus.*

DESCRIPTION OF THE PLATES.

PLATE XLVI.

Geodia carinata, Bowerbank.

Fig. 1 represents the type specimen of the species surrounding the remains of the stem of a large *Gorgonia*, natural size.

2. Three of the multiangulated cylindrical spicula from the dermal membrane, magnified 530 linear.

3. One of the attenuato-spinulate skeleton-spicula, magnified 123 linear.

4. A fully developed aborescent subsphero-stellate retentive spiculum from the interstitial membranes, magnified 530 linear.

5 represents one of the ovaria, magnified 250 linear.

Geodia imperfecta, Bowerbank.

Fig. 6 represents the type specimen, parasitical on *Oculina rosea*, natural size.

7. An average-sized subfusiformi-acerate skeleton-spiculum, magnified 80 linear.

8, 9, 10, 11. Varieties of the undeveloped or malformed attenuato-patento-ternate connecting spicula, magnified 80 linear.

Fig. 12. A fully developed sphero-stellate retentive spiculum with cylindro-subfoliate radii, magnified 530 linear.

13. A fully developed attenuato-stellate retentive spiculum, magnified 530 linear.

Geodia reticulata, Bowerbank.

Fig. 14 represents the type specimen parasitical on the remains of the stem of a fucus, natural size.

15. One of the fusiformi-acerate skeleton-spicula, magnified 80 linear.

16. A well-developed attenuato-patento-ternate connecting spiculum, magnified 80 linear.

17. A portion of one of the long and rather slender recurvo-ternate connecting-spicula, magnified 80 linear.

18. A portion of one of the porrecto-ternate connecting spicula, magnified 89 linear.

19. One of the attenuato-stellate retentive spicula, magnified 530 linear.

20. An average-sized cylindro-stellate retentive spiculum, magnified 530 linear.

PLATE XLVII.

Halispongia ventriculoides, Bowerbank.

Fig. 1. A small but very perfect specimen of the species, with the remarkable orifice at the base of the sponge, natural size.

2. A well-formed cup-shaped specimen of the species, with a fan-shaped offset attached to its base, natural size.

Halispongia Mantelli, Bowerbank.

Fig. 3 represents the type specimen of the species, natural size.

4. A section of *H. Mantelli* at right angles to its external and internal surfaces, exhibiting the reticular structure of the skeleton with the embedded particles of sand at both surfaces: *a*, the external surface; *b*, the internal one: magnified 60 linear.

8. On a small Collection of Birds from Bulama, one of the Bissagos Islands, W. Africa. By R. BOWDLER SHARPE, F.L.S., F.Z.S., &c., Senior Assistant, Zoological Department, British Museum.

[Received April 17, 1874.]

I am indebted to Major Bulger for the opportunity of examining a small collection made by his brother Lieut. Bulger in Bulama Island; and as no one has before collected in the locality, I give a short list of the species. Major Bulger has sent me the following note on the locality whence these birds come, which I cannot do better than reproduce:—

"The Bissagos or Bijuga Islands lie on the west coast of Africa, between 11° 40′ and 10° 50′ N. lat., and 15° 30′ and 16° 30′ W. long., opposite the mouth of the river Bulola or Rio Grande. They form a group of about twenty islands, enclosed by a reef. Most of them are inhabited; but some are nearly bare rock, and only visited occasionally. The largest, Marshi, is above 15 miles long. The islands Carache, Corbele, Cazegut, Gallinas, Orango, Canyabac and Bulama are much smaller. On Bulama the English formed a settlement in 1792; but it was abandoned in 1793 on account of its unhealthiness. These islands, which are of volcanic origin, have an excellent soil, composed chiefly of decomposed lava and vegetable matter. They are mostly covered with wood; but there are some natural savannas, and a few clear spaces, affording ample pasturage for innumerable elephants, deer, buffaloes, and other wild animals. The inhabitants cultivate some maize, and have plantations of bananas and palms; but their chief wealth consists of cattle and goats. It is remarkable that the hippopotamus is found in the straits which divide the islands of Canyabac and Bulama from the continent; there is no freshwater river within several miles."*

The avifauna of Bulama is, as might have been expected, thoroughly Senegambian, as far as we can judge from so small a collection as the present. The nearest point of Africa, Bissao, has been thoroughly explored by M. Beaudouin and other French naturalists; but I am not aware that any connected account of their collections has ever been published.

1. *Asturinula monogrammica.*
2. *Coracias abyssinica.*
3. *Merops ægyptius.*
4. *Corythornis cyanostigma.*
5. *Schizorhis africana.*
6. *Nectarinia cyanocephala.*
7. *Nectarinia cuprea.*
8. *Nectarinia subcollaris.*
9. *Laniarius barbarus.*
10. *Laniarius bakbakiri.*
11. *Terpsiphone nigriceps.*
12. *Pholidauges leucogaster.*
13. *Euplectes flammiceps.*
14. *Coliostruthus macrurus.*
15. *Hyphantornis luteolus.*
16. *Spermestes bicolor.*
17. *Estrelda rufopicta.*
18. *Treron calva.*
19. *Turtur erythrophrys.*

The collection contains a specimen of *Laniarius bakbakiri*, apparently identical with South-African examples. This is the first time that this species has been known to occur in West Africa; and I was inclined to doubt its Bulama origin. Major Bulger, however, believes that it was collected with the other birds, but has kindly promised to inquire into the matter on his brother's return.

May 19, 1874.

Dr. E. Hamilton, V.P., in the Chair.

Mr. Sclater exhibited a skin of *Ciconia boyciana*, Swinhoe (P.Z.S. 1873, p. 513, and 1874, p. 2, Pl. I.), being that of one of the two specimens recently living in the Gardens†, and stated that he had received a communication from M. L. Taczanowski of Warsaw, C.M.Z.S., from which it would appear that this species was the ordinary White Stork of Eastern Siberia. The following was an extract from M. Taczanowski's letter. After stating that M. Severtzow had

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* Life of Capt. Beaver by Smyth; and Capt. Belcher in the Journ. of the Geogr. Soc.

† This specimen is now in Lord Walden's collection.

distinguished it as a new species, he continued :—" Le Dr. Dybowski l'a rencontré en nombre assez considérable sur le fleuve Ussuri sous le 48° de lat. bor., où un certain nombre est resté pour l'hiver. Il dit dans sa lettre du Novembre 1873, qu'elles se nourrissent pendant cette saison de *Salmo leucomænis*, qui y ont péri en quantité après avoir frayé, et leurs cadavres se sont accumulés dans la glace ou ont été rejetés sur sa surface. Il a envoyé une peau d'un mâle tué le 17 Octobre 1873."

An extract was read from a letter of Dr. W. Peters, Foreign Member, in which it was stated that he had lately received from Panama a specimen of the very rare and curious Lizard described and figured in the Society's 'Proceedings' for 1863 (p. 154, pl. xxi.) as *Poriodogaster grayi*, Smith; so that this would appear to be the true *patria* of this species, and not Lower California, as suggested by Dr. Gray.

An extract was read from a letter of Dr. J. Hector, C.M.Z.S., pointing out an error in his paper on *Cnemiornis calcitrans* (P. Z. S. 1873, p. 763). The words "weight" and "bulk" over the two columns in the table at the bottom of the page have been accidentally transposed, similar *bulks* of bone having been compared, which produce varying *weights*.

The table should stand as follows :—

	Bulk.	Weight.
1. *Cnemiornis*	10	244
2. *Ocydromus*	10	210
3. *Stringops*	10	187
4. *Nestor*	10	131
6. *Hieracidea*	10	126

showing that the humerus of *Cnemiornis* is by far the heaviest.

Prof. Newton exhibited and made remarks on two letters, the property of J. B. Wilmot, Esq., M.D., written from Mauritius 18 June, 1628, by Emanuel Altham, referring to a live Dodo which he was then sending to England.

A communication was read from Dr. J. E. Gray, F.R.S., containing a list of the species of Feline Animals (*Felidæ*).

Mr. G. Busk, F.R.S., presented two communications from Mr. W. C. M'Intosh, of Murthly, Perthshire. The first of these was entitled, "Contributions to our knowledge of the British Annelida;" and the second contained the first portion of an account of the Annelida collected during the 'Porcupine' Expeditions of 1869 and 1870.

These papers will be printed in the Society's 'Transactions.'

The following papers were read :—

1. On the Habits of the Burrowing Owl (*Pholeoptynx cunicularia*). By W. H. Hudson, C.M.Z.S.

[Received April 20, 1874.]

The Burrowing Owl is abundant everywhere on the open level pampas of the Argentine Republic, and avoids woods but not districts abounding in scattered trees and bushes.

It sees better than other Owls by day, and never affects concealment, nor appears molested by diurnal sounds and the glare of noon. When a person passes near one it stares fixedly at him, following him with the eyes, the round head turning about as on a pivot. If closely approached, it drops its body in a somewhat playful fashion, emitting a brief scream, followed by three abrupt ejaculations—and if made to fly, goes but fifteen or twenty yards off, and alights again with face towards the intruder; and no sooner does it alight than it repeats the gesture and scream, standing stiff and erect, and appearing beyond measure astonished at the intrusion. By day it flies near the surface with wings continuously flapping, and seldom goes far, and invariably before alighting glides suddenly upwards for some distance and comes down abruptly. It frequently runs rapidly on the ground, and is incapable of sustaining flight long. Gaucho boys pursue them for sport on horseback, taking them in fifteen or twenty minutes. They live in pairs all the year, and sit by day at the mouth of the burrow or on the Vizcacha's mound, the two birds so close together as to be almost touching; when alarmed they both fly away, but sometimes the male only, the female diving into the burrow. Their sitting on the ground may be more from necessity than choice, as they usually perch on the summits of bushes where such abound.

These are the commonest traits of the Burrowing-Owl in the settled regions, where it is excessively numerous and familiar with man; but in the regions hunted over by the Indians it is scarce, and in some of its habits quite a different bird. Shy of approach as a persecuted game-fowl, it rises to a considerable height in the air when the approaching traveller is yet far off, and flies often beyond sight before descending again to the earth. This wildness of disposition is, without doubt, traceable to the active animosity of the pampa tribes, who have all the ancient wide-spread superstitions regarding the Owl. Sister of the Evil Spirit is one of their names for it. They hunt it to death whenever they can, and, when travelling, will not stop to rest or encamp on the spot where an Owl has been seen. As soon as the plains are settled by whites, the bird drops this wary habit, and becomes exceedingly tame. They are also tenacious of the spot they live in, and are not, like the Pipit and Spurred Lapwing, driven out by cultivation. When the fields are ploughed up, they burrow on the borders of the ditches, and sit on the wayside fences, and are so tame that a rider can easily knock them down with his whip. Several pairs live near my house; and when a person rides up to within three or four yards of a burrow the birds only snap and hiss and ruffle up their feathers, refusing to fly away.

Occasionally the Owls are seen preying by day, especially when any thing passes near, offering the chance of an easy capture: often I have amused myself throwing bits of earth near one as it sat by its kennel; for the bird will immediately give chase, only discovering its mistake when the stone is firmly clutched in its talons. When rearing their young they are perhaps quite as active by day as by night. On the hot days of November multitudes of two large species of *Scarabæus* appear; and the bulky bodies and noisy bungling flight of these beetles invite the Owls to pursuit; and on every side they are seen chasing and striking down the beetles, and tumbling upon them in the grass. Owls have a peculiar manner of taking their prey: they grapple it so tightly in their talons that they totter and strive to steady themselves by throwing out their wings this way and that, and, often losing their balance, fall prostrate, and flutter on the ground. If the animal captured be small, they proceed after a while to dispatch it with the beak; if large, they usually rise laboriously from the earth, and fly to some distance with it, thus giving time for the wounds inflicted with their claws to do their work.

How remarkable it is that the *Tænioptera* (so different in structure from Owls) should resemble them in the peculiar manner of seizing their prey!

The *Tænioptera* frequently darts upon a large insect on the ground, and, grasping it with its feet, flutters and totters precisely like an Owl. This habit I have observed in four species of *Tænioptera*.

At sunset the Burrowing Owls begin to hoot; a short followed by a long note is repeated many times, with an interval of a second of silence. There is nothing dreary or solemn in this performance; but it is rather soft and sorrowful, somewhat resembling the lowest notes of the flute in sound. In spring they hoot a great deal, many birds responding to each other.

In the evening they are often seen hovering at a height of 40 yards above the surface, and continuing a minute or longer without altering their position. They do not drop the whole distance at once on their prey, but descend vertically, tumbling and fluttering, as if wounded, to within 10 yards of the earth, and then, after hovering a few seconds more, glide obliquely upon it. They prey on every living creature not too large to be overcome by them. Sometimes they sever off and leave untasted the head, tail, and feet of a mouse. The hind quarters of frogs and toads are almost invariably rejected; and inasmuch as these are the most fleshy and succulent parts, this is a strange and unaccountable habit. They make an easy conquest of a snake 18 inches long, and kill it by dealing it blows with the beak, hopping briskly about it all the time, and appearing to guard themselves with the wings. Many individuals become destructive to poultry-yards, carrying off the chickens by day. In seasons of plenty they destroy more prey than they can devour; but in severe winters they come, apparently starving, about the houses, and will then stoop to carry off any dead animal food, though old and dried up as a bit of parchment. This I have often seen them do. Though the Owls are always on familiar terms with the Vizcachas, and occasionally breed in one of their neglected burrows, they generally excavate their own burrows. The kennel is crooked, and varies greatly in length, from 4 to 12 feet. The nest is at the extremity, composed of wool and dry grass, often exclusively of horse-dung. The eggs are five, white, and nearly spherical. After the female has begun laying, the birds continue to carry in dry horse-dung, until the floor of the burrow and a space before it is thickly carpeted with this material. The following spring the loose earth and rubbish is cleared out; for the same burrow may serve them two or more years. It is always untidy, but mostly so during the breeding-season and when prey is very abundant, the floor and ground about the entrance being often littered with excrements and pellets of hair and bones, wing-cases of beetles, and feathers, hind quarters of frogs in all stages of decay, the great hairy black spiders of the pampas, and remains of half-eaten snakes and other unpleasant creatures they subsist on. But all this carrion about the Owl's disordered house reminds one forcibly of the important part assigned to it in the natural economy. The young birds ascend to the entrance of the burrow to bask in the sun and receive the food their parents bring: when approached they become irritated, snapping with their beaks, and appearing reluctant to enter the burrow; but for some weeks after learning to fly they make it their refuge from danger. Old and young birds often live four or five months together. I believe nine tenths of the Owls in this country make their own burrows; but as thay occasionally prefer breeding in the forsaken burrows of mammals to mining themselves, it is probable they would almost always observe this last habit did suitable burrows abound.

I have never seen any complete account of the North-American form of this Owl, but presume its habits are now well known, as all matters connected with science receive so much attention in that country. From such stray notices of the bird as I have met, I learn that it inhabits and invariably breeds in the kennels of the Prairie-Marmot. The small, neat burrows of that mammal must be far better suited to its requirements than the vast ones excavated by the Vizcacha.

Probably the Burrowing Owl originally acquired the habit of breeding in the earth in open level bare regions; and when this habit (favourable as it could not but be in such shelterless places) had become ineradicable, a want of suitable burrows would lead it to clean out such old ones as had become half filled with rubbish, to deepen such as were too shallow, and ultimately to excavate new ones.

In Buenos Ayres the mining instinct varies greatly in individuals. In the birds that breed in Vizcachas' burrows the instinct is doubtless weak; they can hardly be said to possess it.

Some pairs, long mated, only begin their burrows when the breeding-season is already on them; others make their burrows as early as April—that is, six months before the breeding-season. Generally both birds work, one standing by and regarding operations with an aspect of grave interest, and taking its place in the burrows when the other retires; but sometimes the female makes the kennel without any assistance from her partner. Some pairs work expeditiously, and their burrows are deep and neatly made; others go about their task in a perfunctory manner, and begin and immediately abandon perhaps half a dozen burrows, and then rest two or three weeks from their unprofitable labours. But, whether industrious or indolent, by September they all have their burrows made.

Most, if not all, the writers who have mentioned our bird err in speaking of its burrowing-habits. Azara was perhaps the first to say that it never constructs its own habitations. Molina (usually judicious) flies to the opposite extreme, and asserts, on the authority of P. Fuiellé, that it burrows to such an amazing depth in the earth, that only the incomparable zeal and industry of Fuiellé himself has enabled us to know the nesting-habits of the bird.

Fuiellé's profound investigations resulted in the discovery that the eggs of the Burrowing Owl are speckled!

2. Description d'une nouvelle espèce de *Mustela* du Pérou central. Par L. Taczanowski, C.M.Z.S.

[Received May 4, 1874.]

(Plate XLVIII.)

Mustela macrura, n. sp. (Plate XLVIII.)

Brunneo-castanea, capite obscuriore; subtus isabellina, pedes cum corpore concolores; cauda corpore paulo breviore, apice nigro aut obscure brunneo.

Deux exemplaires, ♂ et ♀, récueillis en 1873 par M. Jelski aux environs du lac Junin (Pérou central), et déposés au Musée de Varsovie, diffèrent spécifiquement de *M. agilis*, Tsch. Leur taille est considérablement plus forte; la queue est beaucoup plus longue, égalant les deux tiers de la longueur du corps, tandis que celle de la *M. agilis* est plus courte que la moitié. Elle présente aussi plusieurs différences en détails de la coloration. La couleur générale est d'un brun marron uniforme, excepté la tête qui est plus ou moins foncée, et l'extrémité de la queue qui est noire ou brun foncée sur l'espace de deux pouces. Les oreilles sont garnies de poils de même couleur que les parties environnantes de la tête. Tout le dessous en commençant du menton, ainsi qu'une bande sur le côté postérieur des pattes antérieures, n'atteignant pas l'extrémité et une bande sur la moitié antérieure du devant des cuisses sont d'une couleur isabelle uniforme, nettement tranchée de la couleur du dessus. Les pattes sont aussi foncées que le pelage général. Un individu a au front un petit trait blanc, l'autre ne présente rien de cette couleur. Le poil est gris brunâtre à la base, et brun marron dans la moitié terminale, sans anneau clair au milieu dont parle

Tschudi dans la description de la *M. agilis*. Le poil des parties inférieures est unicolore. Les griffes sont blanchâtres. Dimensions en millimètres :

	♂.	♀.
Long. depuis le nez jusqu'à la naissance de la queue	270	270
„ de la queue avec le poil	185	175
„ de la queue sans poil	150	173
„ de la tête	60	60
„ du tarse avec les griffes	51	51

C'est l'espèce la plus voisine de la *M. frenata* du Mexique ; la grandeur est presque la même, ainsi que la proportion de la queue, qui est aussi presque également velue, terminée en pointe et non pas en pinceau comme dans la *M. erminea*.

Sans doute c'est l'animal mentionné par Tschudi*, il dit : "Nous supposons que plusieurs différentes espèces s'y trouvent, car nous avons vu plusieurs fois une belette près de deux pieds de longueur, sans avoir eu le bonheur de la tuer. Les renseignements des Indiens confirment notre supposition." Notre animal est plus petit, car il n'a que 18 pouces, mais Tschudi a pu exagérer sa grandeur en comparant avec *M. agilis*.

3. Notes on the Respiration of some Species of Indian Freshwater Fishes. By G. E. Dobson, B.A., M.B., C.M.Z.S., F.L.S.

[Received April 20, 1874.]

The following notes on the respiration of some species of Indian freshwater fishes were derived from experiments made in the months of April, May, and June last year upon several specimens from the river Hooghly, near Calcutta. The number of species examined was eleven, representing six families—namely, Siluridæ, Symbranchidæ, Cyprinidæ, Labyrinthici, Ophiocephalidæ, and Mastacembelidæ.

Previous observers † of the habits of the freshwater fishes of tropical countries had remarked that some species required atmospheric air directly for the purpose of respiration, and if prevented from obtaining it were suffocated, precisely as land animals would be. To such species the term "aerial" or "compound breathers" has been applied, in contradistinction to that of "water-breathers," which is applicable to most species of fishes.

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* Fauna Peruana, Säugeth. p. iii.

† To avoid entering upon an account here of what has been observed on the same subject previously, it will be sufficient to refer to Mr. Boake's paper on the fishes inhabiting the Ceylon marshes, published in the Journal of the Ceylon Branch of the Royal Asiatic Society, 1865, and to Mr. Francis Day's paper entitled "Observations on some of the Freshwater Fishes of India," in P. Z. S. 1868, pp. 274–288, in which, besides an account of many most interesting and original experiments on the respiration of these fishes, the investigations of previous observers are described or referred to.

The following experiments were undertaken with the view of extending our knowledge in this direction, by determining what other species are compound breathers, and in what degree the direct use of atmospheric air is necessary for their existence.

The manner of conducting the experiments was similar to that adopted by Mr. Francis Day [*], to whose investigations these notes may be regarded as addenda.

The specimens experimented upon were recently taken and quite uninjured. The temperature of the water during the period occupied in making the following observations varied very slightly, from about 87° to 91° Fahr.

Exp. 1.—A specimen of *Plotosus canius* was placed in a large cylindrical glass jar (of equal diameter throughout) nearly filled with water, and having a metal plate, pierced throughout with large openings, fixed 1 inch beneath the surface of the water. The metal plate was fixed in this position immediately after the fish had been observed to rise to the surface of the water. Twelve minutes afterwards the fish again rose and pushed violently against the plate, but not succeeding in getting to the surface it sank slowly to the bottom of the jar. Having remained thirteen minutes at the bottom rapidly moving the gill-covers, it made a second attempt to reach the surface, and dashed so strongly against the plate as to force it upwards, and so obtained access to the air. On sinking down again, a large number of air-bubbles passed upwards from the gill-openings.

The fish was then placed for the night in a large earthenware basin, with a specimen of *Ophiocephalus punctatus* about the same size. Next morning the latter had eaten the greater portion of the barbels of the former, and had torn away the skin of the abdomen. The greater portion of the anal fin was detached from the body and eaten, but the fish seemed as lively as before. Two other fish of the same species had leaped out of another basin, and were found dead on the floor. The *Plotosus* was again placed in the same glass jar, having a diaphragm of net fastened 1½ inch below the surface of the water. It remained inactive for nearly half an hour, then sought the surface, but being repulsed by the net struggled violently against it, during which time several air-bubbles passed from the gill-openings to the surface of the water. It died in one hour from the time of being first placed in the jar, and in half an hour from first commencing its struggles.

Exp. 2.—Placed four specimens of *Macrones tengara* at 10.40 A.M. in the glass jar, the netted diaphragm being fixed as in Exp. 1. In another jar without a diaphragm two specimens were also placed. At 3 P.M. the respiratory action of the fish in the jar with the diaphragm became much excited; at 3.40 the largest individual, which had been for some time swimming about, rose to the net and pushed against it several times; at 4.40 all the fish had almost ceased to respire, and lay at the bottom of the vessel. To show that their deaths were not due to a deleterious condition of the water, it was carefully drawn off (a small portion sufficient to cover the fish being allowed to remain) and fresh substituted, without, however, permitting the fish to reach the surface. The fresh water seemed to produce no change in their condition. At 5 P.M. the largest specimen lay on its side; at 7 P.M. all were dead. Both the specimens in water with free access to the surface were alive at this hour; but one died at 10 P.M., probably from wounds it had received; the other was found dead next morning*.

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[*] *Loc. cit.* p. 278, exp. 1 & 4.

Exp. 3.—A specimen of *Saccobranchus singio* was placed in the same jar, having the netted diaphragm similarly fixed 1 inch beneath the surface of the water. It made but few attempts to reach the surface, and died in four hours. Another specimen placed in the jar afterwards swam about in a very lively manner, and made several attempts to reach the surface of the water; it died in two hours.

The difference in the time required to cause suffocation was probably due to the greater exertions made by the second specimen, which exhausted the supply of air faster.

Other specimens kept for observation in my aquarium with free access to the air were observed, when approaching the surface of the water, to discharge a considerable amount of air from the gill-openings, immediately afterwards placing the muzzle above the water.

Exp. 4.—A specimen of *Amphipnous cuchia* † was placed in the glass jar, which was more than half filled with fresh water. The netted diaphragm was omitted, in order to observe its mode of respiration. The habits of the animal while in the water were noted during eight days, with the following results:—It was found that the fish either lay in a semitorpid state at the bottom or remained suspended in the water, keeping its head resting against the side of the jar about 1 inch or less below the surface. The used-up air was expelled from the gill-apertures, at first slowly, one bubble succeeding another till four or five were discharged; the remaining air was then expelled by a single effort, the fish immediately sinking to the bottom of the jar, most probably as the direct result of suddenly increased specific gravity. Usually in about two minutes afterwards the animal raised itself by muscular effort, placed the muzzle at the surface of the water, separated the lips slightly (precisely as a snake does when about to hiss), and took in air, the branchial sacs behind the commissure of the lips becoming inflated *.

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* I do not consider the above-described experiment as conclusively proving this species to be a mixed air- and water-breather; for although very many specimens were procured by me for the purpose of examining their respiration, the greater number died before I could find an opportunity for making the necessary experiments; and even those examined were most probably in a sickly condition, as shown by the death of the other two specimens, not confined beneath the surface of the water, a few hours later. When placed in the aquarium these fish invariably kept swimming round and round, having the extremity of the muzzle at the surface of the water, or remained vertically suspended with the mouth at the surface. This seems to me to indicate that unmixed air was also required for the purpose of respiration.

† For a description of the respiratory organs in this fish, see Owen's 'Anatomy of Vertebrates,' vol. i. pp. 481 & 487.

The fish was, on the ninth day, removed from the water and placed in a basket with some moistened grass. It lived there for five days without water. Unlike other fish kept for experimental purposes, it refused food of any description during the whole time it remained alive.

Exp. 5.—A specimen of *Lepidocephalicthys balgara* was placed in the glass jar, which was half filled with fresh water. No diaphragm was used. The fish was observed to pass to the surface of the water rapidly, and apparently blow off from the mouth some air-bubbles. It immediately retreated to the bottom, and there the action of the gill-covers was exceedingly rapid, so rapid as to be impossible to count, perhaps 200 in a minute. It was seen but on two occasions to go to the surface during the whole day; but from the presence of bubbles on the surface it was suspected that it went on many other occasions when not observed.

The glass jar with the fish in it was taken for the night into my bedroom. About one o'clock I was awakened by some noise, and heard a sound between a grunt and a squeal. I thought a Rat had got into the room (a not uncommon occurrence in the East), and lit a candle to see where the intruder was. On going to that part of the room whence the sound proceeded, I was surprised to find that my little fish was the cause of all the disturbance. He had leaped out of the glass jar (the edge of which was 3 inches above the surface of the water), and had fallen to the ground, a distance of 4 feet. I found him wriggling about in the dust, occasionally uttering a squeal. On taking the fish into my hand he again made the same noise, which is very peculiar.

On the following evening the same fish remained in the glass jar without water from 8 P.M. to 10.30 P.M., and on being again placed in water appeared to have sustained no injury. When placed in shallow water it remained suspended in the water, its head just beneath the surface, respiring very rapidly. It supported itself in this position by resting on its tail and lying against the side of the vessel, precisely as *Amphipnous cuchia* in Exp. 4.

On the approach of any object close to the side of the vessel, the fish always turned its head towards the object, and the gill-covers ceased to move, the animal regarding the intruder intently for some time; then, when satisfied that no immediate harm was to be feared, the action of respiration was resumed, the gill-covers moving as rapidly as before.

Two days after its attempt to escape at night the same fish (which appeared quite as lively as when first obtained) was placed in the same glass jar. A double net was stretched about half an inch beneath the surface of the water. Fifteen minutes afterwards the fish suddenly rose and attempted to reach the surface, then sank down, and again renewed the same attempt more vigorously. Five minutes afterwards it rose again, and pushed strongly against the net. Thirty minutes afterwards it swam about excitedly round and round the vessel. Two hours subsequently, in some way I did not perceive, it splashed water up through the double net violently, so that some drops fell outside the jar, the mouth of which was nearly 4 inches above the surface of the water. Fifteen minutes afterwards I saw the fish resting vertically on the extremity of the caudal fin, having its head thrust through one of the meshes of the lower net, and the extremity of the snout at the surface of the water through a mesh of the upper net. The depth of the water was such that the fish exactly reached the surface with the snout when suspended vertically resting on the tip of the caudal fin.

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* The branchial sacs in the inflated condition appear to act also as floats, retaining the head of the animal near the surface of the water in a convenient position for capturing its prey.

The netted diaphragm was now raised 1 inch higher, and water added, so that the net was 1 inch beneath the surface. In thirty-seven minutes the fish again sought the surface, and succeeded in thrusting its head and part of its body through the meshes of both nets, so that its muzzle rested at the surface of the water. In this position it remained quiet, apparently drawing in the unmixed air, and would only leave its position when touched several times. Soon afterwards it again forced its way through the net as before; and two minutes afterwards some bubbles of air passed from its mouth. On shaking the vessel some air-bubbles passed upwards from the gill-openings.

The net was now removed and a perforated tin plate substituted. In forty-five minutes the fish swam about in an excited manner, and then sank to the bottom. It made several attempts to reach the surface, and at length managed to force itself through a somewhat larger opening in the centre of the plate, which I had thought much too small for it to get through. Immediately on reaching the surface it discharged a large amount of air under water, as a great number of bubbles came up about it. It remained in shallow water (about half an inch deep) all next day, and appeared very lively in the evening. On the following day I observed that soon after taking in air at the surface and sinking to the bottom of the vessel, a large amount of air passed upwards in bubbles from the anus.

The fish was removed to a larger jar, fresh water placed in it, and a tin plate pierced throughout with openings of an equal size, too small to allow the animal to gain access to the surface. The fish made many attempts unsuccessfully to reach the surface, and at length sank to the bottom and remained quiet there, the gill-covers moving, however, very rapidly. In twenty-four hours the fish was evidently about to die; the dorsal fin had collapsed, and the gill-covers had almost ceased to move. The diaphragm was removed, and fresh water placed in the jar. The fish immediately recovered strength, the dorsal fin became erect, and respiration proceeded as before. On the following night he again leaped out of the jar, and was found dead on the floor next morning.

Exp. 6.—Another specimen of *Lepidocephalicthys balgara* was placed in the glass jar in about 3 inches of water without the diaphragm. It remained for a long time vertically suspended in the water, with the extremity of the snout at the surface, taking in air, which occasionally passed upwards in bubbles from the gill-openings and from the anus.

On some occasions, on being disturbed, it would rise from the bottom, quickly attain the surface, and almost immediately afterwards discharge a considerable amount of air from the anus.

Exp. 7.—Two specimens of *Anabas scandens*[*], the Common Climbing Perch of India, were placed in a glass jar, and a diaphragm of net fixed at about 1 inch beneath the surface of the water. Almost immediately on being placed in the water the fishes rose and attempted to reach the surface. They continued their attempts for about five minutes, striking vigorously against the net; they then sank down, and died in twelve minutes from the time they were prevented from having access to the surface of the water.

Exp. 8.—A specimen of *Trichogaster fasciatus* was placed in the same glass; and immediately after it had been observed to rise to the surface of the water the netted diaphragm was fixed half an inch beneath the surface—at 12 noon. Two minutes afterwards it again attempted to rise, but, being repulsed by the net, swam about, seeking for some means of exit. During the succeeding hour it frequently rose towards the surface and struck violently against the net and the sides of the vessel, the respiration becoming much affected, the gill-covers moving very rapidly. At 3 P.M. the fish lay at the bottom of the jar on its side; at 3.20 P.M. it again attempted to reach the surface, but had lost the power of maintaining its equilibrium, and moved convulsively about with the abdomen upwards; at 3.30 P.M. it lay expiring at the bottom of the jar.

The net was now removed; and the fish succeeded by a violent effort in reaching the surface of the water, when it quickly drew in some air and again sank to the bottom. It appeared much revived, but still lay with the abdomen upwards. Soon afterwards it rose again to the surface, and remained suspended vertically in the water with the extremity of the snout at the surface, and continued in this position for some minutes. Again it sank downwards, but appeared better able to maintain its equilibrium. After rising several times to the surface the fish regained completely the power of maintaining its equilibrium, appeared nothing the worse for what it had suffered, and swam about as usual.

The same experiment was repeated with the same fish on the following morning. It was placed in pure well-aerated water. The same results took place; and it died in four hours and a quarter.

Exp. 9.—Placed a specimen of *Ophiocephalus striatus*, 11 inches long, in the glass jar, and fixed the netted diaphragm 1 inch beneath the surface of the water. After seven minutes the fish became uneasy, and frequently rose towards the surface, but was repulsed by the net. Five minutes afterwards it rushed with great force against the net, burst one of the meshes, and passed through it to the surface. Having accomplished this it remained tranquil, resting on the upper surface of the net.

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[*] The accessory respiratory organs of this fish are described in 'Owen's 'Anatomy of Vertebrates,' vol. i. p. 487.

The same fish was, on the following day, replaced in the same jar and the net strengthened. The animal remained tranquil for five minutes, then became uneasy and dashed about violently, several bubbles of air passing upwards from the gill-openings. Occasionally it would remain quiet at the bottom for one or two minutes, then become very uneasy, and struggle powerfully against the net. Half an hour after immersion the fish became even more energetic in endeavouring to break the net, but soon became weaker, and died in 1 hr. 10 min.

Repeated the same experiment with three smaller-sized specimens of the same species. Immediately after the diaphragm had been fixed the fish rose and attempted to reach the surface, striking violently against the net. They then sank to the bottom, and during the first half hour frequently renewed their attempts to reach the surface. One of the fishes thrust its head through one of the meshes of the net and was retained in that position. The other two died at the same time, in 1 hr. and 5 min. (lying at the bottom in 10 inches of water); the third fish (which was retained in the mesh of the net near the surface, above which it did not, however, get its mouth) died twenty-five minutes afterwards.

The experiment was again repeated. Two specimens of the same species were placed in about 6 inches of water, with a perforated metal plate half an inch beneath the surface. They struggled in precisely the same manner, and then lay at the bottom for some minutes, the gill-covers moving slowly and with difficulty. Struggled violently one hour after the diaphragm was fixed, and died in 1 hr. 35 min.

Exp. 10.—A specimen of *Ophiocephalus punctatus*, 4 inches in length, was placed in the same glass jar at 1.55 P.M.; at 2.10 P.M. it rose towards the surface and pushed against the net; at 3.30 P.M. it feebly endeavoured to reach the surface, but soon sank down exhausted. Respiration appeared to have entirely ceased; a large bubble of air passed upwards from its mouth; and it died three minutes afterwards.

Another specimen of the same species was subjected to the same experiment. The fish became much excited after being placed in the water, and swam about rapidly, striking against the netting for about two or three minutes. It then sank to the bottom and remained quiet. On being roused up ten minutes afterwards it again rose and made many energetic attempts to reach the surface, during which a bubble of air escaped from its mouth. It again sank to the bottom and remained there, the gill-covers moving very slowly. Death occurred in 4 hrs. 40 min. The mouth was widely opened towards the time of death.

Exp. 11.—At 11 A.M. placed a specimen of *Mastacembelus pancalus* and one of *Rhynchobdella aculeata* in the glass jar, fixing the netted diaphragm as in preceding experiments. Both the fishes made several attempts to reach the surface; the *R. aculeata* nearly succeeded in pushing its body through the net at 3.30 P.M.: at 4 P.M. the same fish remained in a vertical position, having its head thrust through one of the meshes of the net, but not at the surface of the water. At the same time the *M. pancalus* lay on its side, moving the gill-covers with difficulty, and in fifteen minutes afterwards it died; twenty minutes afterwards, at 4.35 P.M., the *Rh. aculeata* died also.

A specimen of *M. pancalus* placed in water with free access to the surface was, at the time of death of the other two, as lively as in the morning.

I kept specimens of both *Anabas scandens* and *Trichogaster fasciatus* in an aquarium in my house at Calcutta for many months, and had constant opportunities for observing their habits. Two specimens of the *Anabas* which had lived in the aquarium from September 1871, were in April 1872 sent by me to the Gardens of the Royal Zoological Society of Ireland. Dr. Isidore Bourke, Surgeon H.M. British Forces, kindly undertook the care of the fish on their way home, and succeeded by great attention in bringing both alive to Dublin. One died three months after arrival, from an injury; the other lived for nine months, and then succumbed to the cold. I am quite satisfied that had the water of the aquarium in which the fish lived in the Dublin Zoological Gardens been kept at a temperature of 75° Fahr., or at least not permitted at any time to fall below 60°, the surviving specimen would have lived (if otherwise uninjured) for many years.

The habits of *Anabas scandens* and *Trichogaster fasciatus* are very similar. Both suddenly rush to the surface, discharge the vitiated air and take in a fresh supply instantaneously, immediately sinking to the bottom, where one or two bubbles of air may often be seen to escape from the gill-openings as if taken in excess. The action of discharging the air from the branchial cavities and taking in a fresh supply is accomplished so rapidly that it is impossible to say whether the used-up air is discharged before the fresh supply is taken in, or displaced by the incurrent stream of air. All that can be seen is, that when the fish places its mouth at the surface of the water a great quantity of air bubbles up about its head.

The *Trichogaster* appears to use the long filiform ray to which the ventral fin is reduced as a tentacle, moving it about towards any passing object. I have often seen one of these fishes move forward this ray and touch with it another fish slightly in front and on the same side, while the ray on the other side remained perfectly motionless directed backwards. Like the *Anabantes* they are fond of chasing one another round and round; and while so engaged the independent action of the single-rayed ventral fins as tentacles may be well seen.

The number of visits to the surface appears to depend, as might be expected, on the amount of muscular action accomplished by the fish, and on the temperature of the water; thus, when actively engaged in chasing one another, and in very warm weather, the visits were very frequent, sometimes three or four times in five minutes. Of all the fish experimented upon the *Anabas* went oftenest to the surface, and consequently was soonest asphyxiated when retained under water *.

The faculty of living out of water, or when the gills are kept in a moistened condition only, not only for hours, but in some cases for days, possessed by many species of *Symbranchidæ*, *Labyrinthici*, and *Ophiocephalidæ* especially, is not alone a wonderful provision of nature enabling these animals to resist the prolonged droughts of the countries they are found in, but is also of the greatest importance to the inhabitants of these countries, who are well acquainted with their vitality out of water, and take advantage of it in transporting them long distances, and in being able to maintain their supply fresh till required for use. Accordingly these fish, though not very delicate in flavour, are highly esteemed by the people of Bengal, especially by the poorer classes, and great quantities of *Anabas scandens*, *Trichogaster fasciatus*, *Ophiocephalus punctatus*, *O. striatus*, and *Amphipnous cuchia* are daily exposed for sale in the bazars.

The *Anabas*, which has the greatest vitality of all out of water except the *Amphipnous*, is kept in closely woven baskets, about one hundred individuals or more in each basket. Thus lying close together, evaporation is greatly lessened and their gills are kept moist. In this condition they live, I have been told by many native fishermen, for four or five days. In very dry weather some water is daily thrown on them, or the basket is immersed for a short time in water.

A constant supply of fresh fish is thus afforded, the importance of which can only be fully appreciated in tropical countries, where fish taken in the morning are often unfit for use by breakfast time.

The experiments here recorded were but the commencement of what I had intended to be a series, including every Indian freshwater fish possible to procure alive. They were undertaken at the suggestion of Mr. Francis Day, to whose most interesting paper on this subject I have referred above. My investigations were suddenly interrupted by my unexpected return to Europe; and as I now see no prospect of revisiting the East Indies for some years, I think it may be well to record the few observations made.

The following Table (p. 321) exhibits the results of the experiments above described, and also of Mr. Day's investigations. The species of fish are arranged according to the time required to produce asphyxia when deprived of access to the surface of the water. The position of *Amphipnous cuchia* is uncertain.

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* As remarked by Mr. Day (*loc. cit.* p. 279), some fishes which take in air at the surface of the water (compound breathers), possess the power of remaining in a state of semitorpidity at the bottom, and in this condition exist for many hours without respiring. This will account for the difference of time required to produce asphyxia in individuals of the same species noted in foregoing observations.

Number.	Names of Fishes.	Time required to cause asphyxia.		Lived without water.	
		In foregoing observations.	In Mr. Day's experiments.	In foregoing observations.	In Mr. Day's experiments.
1.	*Anabas scandens*	12 minutes.	Not determined.	Not determined.	24 to 26 hours.
2.	*Plotosus canius*	1 hour.	„	„	Not determined.
3.	*Ophiocephalus striatus*.........	1 hr. 5 min. to 1 hr. 35 min.	„	„	16 hours.
4.	—— *punctatus*	1 hr. 38 min. to 4 hr. 40 min.	1 hr. 21 min. to 1 hr. 28 min.	„	3 hr. 25 min.
5.	*Saccobranchus singio*	2 to 4 hours.	Not determined.	„	Not determined.
6.	*Trichogaster fasciatus*	3 hr. 40 min. to 4 hr. 15 min.	„	„	„
7.	*Amphipnous cuchia*	Not determined.	„	Five days.	„
8.	*Mastacembelus pancalus*	5 hr. 15 min.	„	Not determined.	„
9.	*Rhynchobdella aculeata*	5 hr. 35 min.	„	„	„
10.	*Plataoanthus agrestis*	Not determined.	8 hours.	„	„
11.	*Lepidocephalicthys balgara* ..	24 hours.	Not determined.	„	„
12.	*Macrones tengara*	8 hrs. 20 min.	Water-breathers, not affected by being prevented from reaching the surface of the water.	„	„
13.	*Puntius stigma*	Not determined.			
14.	*Amblypharyngodon jerdoni* ...	„			

. Description of a new Species of Cat (*Felis badia*) from Sarawak. By Dr. J. E. Gray, F.R.S. &c.

[Received April 29, 1874.]

(Plate XLIX.)

Mr. Wallace, in 1856, sent from Sarawak to the British Museum the skin of a small Cat (unfortunately so torn in being taken off as not to be able to be stuffed) and its skull.

I have been waiting, in the hopes of getting a skin in more perfect condition; but as none has arrived I think it as well to describe the torn specimen, and draw the attention of naturalists to the existence of a small long-tailed Cat, of a nearly uniform reddish-brown colour, from that country.

The skull has the short rounded face, and the back of the orbit interrupted, as in the restricted genus *Felis*, and belongs to an animal that, though it was not aged, had reached nearly the adult age.

The skin is of a uniform or self-colour, like the Puma, the Eyra, and the Jaguarondi of South America, and agrees with them in the cheeks behind the eyes being coloured like the rest of the head, and destitute of the two pale rays from the back of the eye, so particular in most of the Cats of the Old World*.

Felis badia. (The Bornean Bay Cat.) (Plate XLIX.)

Fur of a bright chestnut-colour, rather paler beneath, the limbs and the tail being rather paler and redder. The tail is elongate, tapering at the end, with a white central streak occupying the hinder half of the lower side, gradually becoming wider and of a purer white towards the tip, which has a small black spot at its upper end. The ears are rounded, covered with short blackish-brown fur at the outer side, paler brown within, and with a very narrow pale margin. The sides of the upper lip, a small spot on the front angle, and the edge of the upper eyelid pale brown. The chin, edge of the under jaw, and gullet whitish.

Hab. Borneo, Sarawak (*Wallace*). B.M.

This Cat has been thought to be a kitten of *Felis temmincki* of Sumatra and Nepaul; but that is a much larger species, and the skull proves this to be a nearly full-grown animal. The difference of the colouring of the head, with the two streaks at the back of the eye, would distinguish even the kitten of *F. temmincki* from *F. badia*.

The tail of *F. temmincki* agrees with that of *F. badia* in being whitish on the underside at the end, but is not so decidedly and definitely white as that of *F. badia*; and it has not the very character-

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Wolf, in the drawing of this Cat, indicates two palish streaks on the I cannot make out in the specimen, which is in a rather bad

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istic black spot on the upper part of its tip; and the tail of *F. badia* tapers gradually towards the tip, while those of the specimens of *F. temmincki* in the Museum are of the same width, and cylindrical, the whole of the length to the tip; but perhaps the tail of the very young kitten of this Cat may be more tapering.

June 2, 1874.

Arthur Grote, Esq., F.Z.S., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during May 1874:—

The total number of registered additions to the Society's Menagerie during the month of May was 137, of which 62 were by birth, 31 by presentation, 18 by purchase, 1 received in exchange, and 25 received on deposit. The total number of departures during the same period, by death and removals, was 102.

The most noticeable additions during the month were:—

1. A Blue-faced Green Amazon Parrot, *Chrysotis bouqueti* (Bechst.), obtained by purchase May 6th, and said to have been brought from Honduras, though I think its more probable habitat is one of the Antilles.

Dr. Finsch says of this bird that it is so rare that he has never been able to examine a specimen, alive or dead.

2. A young male Koodoo (*Tragelaphus strepsiceros*), purchased May 12th. This animal is in very poor condition, but is progressing favourably, and was thought a desirable purchase, as we have already a fine female of the same species in the collection.

3. An example of the Raccoon-like Dog, *Nyctereutes procynides* (Gray), purchased May 21st, said to have been brought from one of the Russian settlements on the Amoorland, where v. Schenck has noted its occurrence (Amur-Reise, i. p. 53).

Of this rare carnivore, of which the present specimen is the only living example I have ever seen, I exhibit a water-colour drawing by Mr. Keulemans (Plate L.).

4. The two Whimbrels announced as having been sent by the Rev. S. J. Whitmee, C.M.Z.S., in his letter read at the meeting on March 17th *, from Quiros Island. These birds are apparently referable to *Numenius femoralis*, Peale, but cannot be certainly determined while alive.

The *Didunculus* sent by Mr. Whitmee on the same occasion unfortunately died before reaching this country.

5. A Beisa Antelope, *Oryx beisa* (Rüppell), obtained at Aden, and presented to the Society by Admiral Arthur Cumming, of H.M.S. 'Glasgow,' Flag-ship at Bombay, May 28th.

We have never before had a specimen of this fine Antelope in the

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* See *antè*, p. 183.

Gardens; and I only recollect having seen one in any of tinental establishments.

6. A Guilding's Parrot, *Chrysotis guildingi* (Vigors) purchased for the Society by Mr. G. H. Hawtayne of St. and received May 29th.

Mr. Hawtayne tells me that this Parrot is now scarce in cent's, and that he has only succeeded in obtaining th specimen after many inquiries. Mr. Hawtayne writes to another species of *Chrysotis* occurs in S. Lucia, of which undertakes to procure examples.

The Dominican *Chrysotis* is *C. augusta*[*]; but I do what the S. Lucian species can be (unless it be *C. bouquet*

The following letter, addressed to the President by M Forsyth, British Envoy to Kashgar, dated Kashgar, 27th 1874, was read:—

"My Lord,—I have much pleasure in forwarding information, and for that of the Members of the Zoologica of London, a note on the Large Wild Sheep, *Ovis poli* which has been drawn up by Dr. F. Stoliczka, naturalist at the present Mission to Kashgar and Yarkund[†]. I am in Lieut.-Col. Gordon for the sketch from life by which it panied, as also for a drawing of the horns of the Maral forwarded.

"Although I anticipate considerable difficulty in conve animals to India by the mountain route across the Karakor attempting to make a collection. Besides the Fat-tailed Shee pushun-yielding goats of Eastern Turkestan, we have here th *gutturosa* and a particularly fine stag, which is worthy notice. This species is known here as the '*Maral*,' und name the Stag is spoken of in Persia. The animal now Mission collection is only about four years old, and has bee confinement from early days. The following measurem give an idea of its proportions:—The height at shoulde (approximate); from between horns to root of tail 74 inc proximate).

"Of birds, we have at present only secured the Ular (*Tet tibetanus*) and the Kiklak (*Caccabis pallidus*), which Hu rates under a distinct name from both the Ladak and th Himalayan Chukor. Many familiar European birds have with since the Mission entered Kashgar territory; and Dr. hopes to send a note regarding those which have been during the winter to 'Stray Feathers.'

"Trusting that these few notes may not be without inter

"I am, yours truly,

"T. D. Fors

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[*] See P. Z. S. 1865, p. 437.

[†] This paper is given below,

The following extracts were read from a letter addressed to the Secretary by Mr. E. P. Ramsay, C.M.Z.S., dated Cardwell, Queensland, April 2, 1874:—

"I find the Cassowary (*Casuarius australis*) by no means rare here, and have secured a fine bird alive for the Society, which I propose sending to you the first chance I have. I hope to be able to get another soon. I have also the egg; it closely resembles that of Bennett's Cassowary (*C. bennetti*), and is of about the same size. The birds had only laid four eggs when the nest was found; it was placed in a dense scrub at the foot of climbing palms (*Calamus*).

"I would have written before about the Cassowary; but it was in a very wretched state when I got it, and so weak that it could not stand. I was afraid it would die, and, remembering the fate of the young Lyre-birds which I had some years ago, was somewhat superstitious. At present, however, at any rate, the Cassowary is all right, and takes good care that no one shall interfere with its domain. I have had a yard built for it here; it is very pugnacious, and kicks and hisses violently at any strangers; it is very fond of bathing. This species (*C. australis*) swims *well*, and the birds have frequently escaped me by swimming across the creeks. I find they are not rare on Hinchenbrook Island, and to get there must swim across a distance of two miles from the mainland. The specimen I have is about 3 feet 6 inches in height, and can reach over 6 feet, and, by jumping, 10 feet high. I have known one in the possession of Subinspector Johnstone of the Police to jump out of its enclosure over a fence more than 6 feet 6 inches high. This specimen was only about 2 feet 6 inches in height and about half the size of my bird, which is now just getting its helmet."

Major Irby, F.Z.S., exhibited specimens of an apparently new species of Raven, which he had lately obtained in the vicinity of Tangier, Morocco, and which he was intending to describe under the name of *Corvus tingitanus*.

Prof. Owen, F.R.S., read the fifth of his series of memoirs on the osteology of the Marsupialia.

This paper will be printed entire in the Society's 'Transactions.'

The following papers were read:—

1. Descriptiones Annulatorum novorum mare Ceylonicum habitantium ab honoratissimo Holdsworth collectorum, auctore Dr. Ed. Grube.

[Received May 6, 1874.]

Inter Annulata ab honoratissimo Holdsworth in mari Ceylonico collecta, a me perlustrata, nonnulla erant mihi nondum cognita, quorum descriptiones, quum de coloribus mensurisque animalium

viventium nihil mihi traditum esset, solum e speciminibus alcohole servatis hoc loco in medium conferam.

CHLOËIA, Sav.

CHLOËIA CEYLONICA, n. sp. (an var. *Chl. flavæ*, Pall. ?).

Oblonga, subtus latior, antrorsum citius, retrorsum lentius magisque attenuata, depressa, pallide carnea, stria dorsi media nigra, angusta, pallide limbata, ad confinia segmentorum interrupta; segmentis 35, *ad latera stria transversa nigra ante fasciculos setarum decurrente, medio interrupta ornatis; tentaculum impar cirrique dorsuales nigri. Lobus capitalis ovalis, fronte biloba; caruncula segmento setigero primo et secundo affixa, usque ad quintum patens, posteriora versus attenuata, parte horizontali basali dense tenere plicata, crista supra nigra, utrinque paribus foliolorum fere* 30 *ornata, tentaculo impari longior. Oculi* 4; *tentacula superiora* 2 *impari breviora, inferioribus longiora et hæc tenuiora; segmenta buccalia* 4, *segmenta medii corporis* 5*plo fere vel* 6*plo latiora quam longa; branchiæ anteriores et posteriores longitudine decrescentes, majores utrinque ramos fere* 7 *pinnatos mittentes, segmentorum anteriorum* 3 *nullæ; cirri dorsuales ventralibus alterum tantum longiores, setas ventrales superantes, ad fasciculum setarum primum, secundum, tertium duplices, interiores albidi, exteriores, primo excepto, nigri; cirri ventrales longitudine ¼ fere latitudinis ventris æquantes; cirri anales digitiformes, dorsualibus proximis breviores, ventralibus longiores; setæ flavidæ, fasciculi dorsualis radiantes, minus numerosæ, apice crenulato-serrato, inferiores multo longiores, penicillum densum componentes, multo tenuiores, apice bifurco.*

Longitudo 42 m., latitudo 8 m., cum fasciculis setarum corpori appressis 13 m.

NEREIS, L. (sens. str. Cuv.).

NEREIS FESTIVA, sp. nov.

Ex carneo flavescens, segmentis 96 *supra fascia transversa angusta, subtus simili lineari serieque transversa macularum nigrarum* 4 *ornatis, lingulis punctoque singulo ad basin inferiorem pinnæ nigris; segmentis mediis duplo fere latioribus quam longa. Lobus capitalis ex hexagono suborbicularis, postice haud emarginatus, parvus, longitudine segmenti buccalis, latitudine ¼ ejus æquante, margine frontali punctis nigris* 3, *posteriore* 2 *infracta; oculi pæne quadratum componentes; tentacula alba, inter se distantia, longitudine lobi capitalis; subtentacula haud longius prominentia, articulis æque longis, basali nigro maculato; segmentum buccali proximo paulo longius, fascia dorsuali medio dilatata; cirri tentaculares superiores posteriores longitudine segmentorum fere* 10, *ceteri multo breviores. Pharynx exsertilis subbrevis; pars ovalis subtus utrinque arcubus linearibus paragnathorum tenerrimorum, serieque media transversa striolarum transversarum duplicium* 4, *ex paragnathis æque distinguendis compositarum armata; maxillæ pallide flavæ, denticulis fere* 6 *munitæ, apice* *nigro. Pinnæ breves, æquales; lingulæ longiusculæ, obtusæ, superiores æque longæ, inferiore magis prominentes; labium pharetræ inferioris lingula sua brevius latius, subpentagonum, a lingula media distans; pharetra superior inferiore vix minus lata, labio distincto nullo; setæ spinigeræ et falcigeræ, falce brevi, numerosæ, flabellum latum efficientes; cirrus dorsualis dupla lingulæ suæ longitudine, ventralis sua satis minus prominens. Cirri anales longissimi, cirros tentaculares longiores superantes.*

Longitudo ad 51 m., latitudo maxima (circa segmentum 26^{tum}) 2·5 m., pinnis additis 3·5 m.

Hæc species *Platynereidibus* Kinbergi adnumeranda.

HESIONE, Sav.

HESIONE CEYLONICA, sp. nov.

Ex fulvescente rosea, splendens, leviter iridicolor, dorso medio e longitudine lineis fuscioribus subviolaceis fere 11 *contiguis, postremum versus evanesentibus striato, partibus lateralibus sepositis, e longitudine sulcatis, segmentis* 19 (*setigeris* 16), *alterum tantum latioribus quam longis, anterioribus et posterioribus* 4 *longitudine et latitudine decrescentibus; lobus capitalis transverse ovalis, pone medium latior, bipartitus, segmento buccali penitus impressus, longitudine segmenti setigeri primi; tentacula brevissima* 2; *oculi* 4, *anteriores æque distinguendi; segmentum buccale lobo capitali minus prominens in confinibus pharyngis exsertilis utrinque puncto nigro ornatum; cirri tentaculares superiores* ¼ *longitudinis corporis æquantes vel superantes, inferiores plus dimidio breviores; cirri dorsuales, anterioribus postremis exceptis, subæquales, latitudinem corporis æquantes, ut tentacularis dense transverse striati, cirri ventrales cum setis pinnarum æque prominentes; pinnæ subconicæ, dense annulatæ, longitudine* ⅓ *latitudinis ventris æquantes, utrinque decrescentes; setæ flavæ, plus vicenæ, falcigeræ, falce minus elongata, apice bidente; segmentum postremum brevissimum; cirri annales læsi, crassitudine dorsualium proximorum.*

Longitudo 25 m., latitudo maxima dorsi 4 m., pinnis additis (sine setis) plus 5 m.

Species cum *Hesione splendida*, Sav., maxime congruens, sed dorso fuscius lineato, haud transverse sulcato, cirrisque tentacularibus longioribus differens.

GLYCERA, Sav.

GLYCERA CINNAMOMEA, sp. nov.

Ex cinnamomeo carnea, anteriora versus minus, posteriora versus sensim satis attenuata; segmentis 195 *biannularibus, annulo pinnigero paulo crassiore duplo vel triplo latioribus quam longis, anterioribus per se brevioribus; lobus capitalis brevis, longitudine segmentorum pinnigerorum proximorum* 5, *paulo longior quam latus, annulis* 11; *tentacula* 4 *brevissima; pinnæ æquales, papilla brevi* (*cirro dorsali*) *ad basim labiisque* 4 *triangulis, et cirro ventrali, omnes anterioribus* 25 *et posterioribus* 20 *exceptis longitudine plerumque* ¼ *latitudinis segmentorum æquantes branchia dorsuali* *instructæ, posteriores per se longiores; labia anteriora inter se ut posteriora æque longa, posteriora breviora; cirrus ventralis, triangulus, basi latiore, cum labiis posterioribus fere æque prominens; branchia ad basin pinnæ prope papillam dorsualem oriens, a labiis remota, erecta, digitiformis, simplex, rarissime bifurca, apicem pinnæ attingens vel brevior, in pinnis anterioribus et posterioribus longitudine maxime decrescens; cirrorum analium* 1 *tantum conservatus, longitudine segmentorum proximorum fere* 8*; pharynx exsertilis papillis brevissimis digitiformibus obtecta, sed pars basalis sola exserta.*

Longitudo 94 m., latitudo maxima (circa segmentum 75tum) 3 m., pinnis additis sine setis 4·5 m.

Species *Glyceræ albæ* Müll. simillima, colore brunnescente locoque originis branchiæ basin pinnæ proximo, haud super cirrum ventralem sito, distinguenda.

CHÆTOPTERUS, Cuv.

CHÆTOPTERUS APPENDICULATUS, sp. nov.

Subgriseus, segmentis fere 46, *sectionis anterioris præter buccale* 10, *mediæ* 4, *posterioris fere* 31; *tentacula longitudine latitudinem segmenti buccalis adæquantia; sectio anterior antrorsum paulo angustior, longior quam lata; pinnæ anteriores* 8, *ad basin dorsualem appendice parva sacciformi obtusa interiore munitæ, quarta sub paleis flavis fortiores* 10 *fere nigras gerens, decima prælonga, longitudine sectionis anterioris; sacci dorsuales sectionis mediæ, inprimis anterioris, tumidissimi; uncini tororum ventralium sectionis posterioris tenerrimi, denticulis brevissimis fere* 20 *armati; cetera cum* Chætoptero variopedato *conveniunt.*

Longitudo ad 124 m., sectionis anterioris 25 m., mediæ 31·5 m., posterioris 68 m.

Corpus animalis descripti minime integrum, sed fragmenta tantum accepi, quorum unum sectionem anteriorem, dua mediam, tria conjuncta posteriorem referebant; quum vero hæc omnia accuratissime inter se convenirent, non dubito, quin ejusdem animalis partes sint, fortasse post mortem demum dissolutæ[*].

Tubus amplus perlongus diametro fere 22 m., longitudine 364 m., tuborum *Chætopterorum* natura, quem siccatum cum Annulatis hic descriptis accepi, ad hanc speciem referendus sit. Cylindratus est, utrinque paulo angustatus, ex stratis membranaceis materiæ chitinosæ tenerrimis hyalinis compositus, superficie striis densissimis rugulisque annularibus repleta, colore arenaceo.

SABELLA, Gr. (sens. str., Sav.).

SABELLA FUSCO-TÆNIATA, sp. nov. (an var. *phæotæniæ*, Schmd.?).

Gracilis, ex griseo lutea, scutis ventralibus ex pupurascente fuscis, segmentis plus 70, *sectionis anterioris longioris quam lata* 8, *triplo*

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[*] [Mr. Holdsworth informs me that Dr. Grube is correct in believing that the fragments submitted to him composed the whole of this worm, and that it was taken whole from the tube associated with it.—P. L. S.]

fere, ceteris 4plo latioribus quam longa; scuta ventralia alterum tantum fere latiora quam longa, sectionis anterioris haud bipartita. Branchiæ æquales, pallide luteæ, fasciis maculisve nullis, semiorbes referentes, longitudine segmentorum anteriorum 32, *lamina basali minus alta,* $\frac{1}{6}$ *longitudinis branchiarum adæquante; fila branchialia utrinque* 13 (14) *æque longa, apice nudo* $\frac{1}{9}$ *longitudinis æquante, utrinque serie ocellorum punctiformium, a media branchiarum altitudine adscendente, ante apicem desinente instructæ; ocelli nigri, simplices, rhachi profunde inserti, numerosi, plus triceni; barbulæ filorum haud flexuosæ,* $\frac{1}{6}$ *longitudinis eorum æquantes; membrana bases filorum conjungens, lamina basali altior; tentacula* $\frac{1}{3}$ *altitudinis branchiarum paulo superantia; collare humillimum, annulare, margine ventrali medio vix inciso, colore branchiarum. Tori uncinigeri sectionis anterioris lati, posterioris angustissimi; uncini aviculares, ordine simplici collocati; fasciculi setarum sectionis anterioris crassiores, posterioris tenuiores, utrinque setas capillares et paleas continentes, primus ceteris latior; setæ capillares sectionis posterioris tenerrimæ, haud limbatæ, leniter curvatæ, anterioris fortiores; paleæ disco suborbiculari, mucrone subtilissimo instructæ, sectionis anterioris sub denæ, distichæ, posterioris quinæ.*

Longitudo animalis haud completi 42·5 m., branchiarum 13, sectionis corporis anterioris 4 m., posterioris 25·5 m.

Sabellæ alticolli Gr. et *S. phæotæniæ* Schmd. simillima, sed in descriptione hujus ocelli haud commemorantur, et branchiæ fasciatæ sunt, basi collarique fusco, in *S. alticolli* lamina basalis multo altior est et ocelli minus numerosi.

2. On the Habits of *Spermophila simplex*.
By W. Nation, C.M.Z.S.

[Received May 15, 1874.]

This plain-coloured *Spermophila* (lately described by M. Taczanowski *) is abundant near Lima, and, I believe, ranges a considerable distance north and south of Lima along the coast.

It frequents shrubs and bushes bordering cultivated land and watercourses, and gardens. It feeds upon the seed of the numerous *Malvaceæ* which abound along the coast of Peru. In the breeding-season it is found singly or in pairs, and in winter in small parties with individuals of *Zonotrichia pileata* and *Spermophila telasco*.

The nest, which is placed upon a branch of a low bush, is composed wholly of the fine twining stems and tendrils of *Passiflora minima*, with a few horsehairs for a lining.

The eggs are three in number, greenish, blotched with pale brown, interspersed with a few deep-brown blotches.

The habits, nest, and eggs of this bird differ considerably from those of *Spermophila*. In *Spermophila* we find a slenderer form, a weaker bill, a slightly more rounded wing, and the claw of the hinder toe weaker and longer.

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* P. Z. S. 1874, p. 132.

Possibly other birds of this form may be found in South America; and then it will be necessary to form them into a distinct genus.

8. List of the Butterflies of Costa Rica, with Descriptions of new Species. By ARTHUR G. BUTLER, F.L.S., F.Z.S., Senior Assistant in the Zoological Department, British Museum, and HERBERT DRUCE, F.L.S., F.Z.S., &c.

[Received May 16, 1874.]

The present list is founded chiefly upon the large collection brought over to England a year or two ago by Dr. Van Patten, and which was perhaps the most complete that ever has or will come from that locality. It was, however, made entirely at or in the neighbourhood of Cartago; and therefore we may still look for novelties from other parts of Costa Rica. Six new species are added in this paper.

A former communication on the collection made by Dr. Van Patten was read before the Society in July 1872; but as we wished to make it a complete list, and to add a few notes on some of the species, it was subsequently withdrawn.

The Moths collected by Dr. Van Patten being almost all day-fliers, would give but a poor idea of the Heterocerous fauna of Cartago, not to speak of Costa Rica; and as we have neither time nor inclination to collate the whole of the descriptions of species in this suborder, we have not included any of them in the present paper.

Family NYMPHALIDÆ (Westwood), Bates.

Subfamily DANAINÆ, Bates.

Genus 1. DANAIS, Latreille.

1. DANAIS CLEOTHERA.

Danais cleothera, Godart, Enc. Méth. ix. p. 185. n. 31 (1819); Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 12. fig. 2 (1847).

2. DANAIS ARCHIPPUS.

Papilio archippus, Fabricius, Sp. Ins. p. 55. n. 243 (1781).

Papilio plexippus, Cramer (*nec* Linn.), Pap. Exot. i. pl. 3. figs. A, B (1775).

Genus 2. LYCOREA, Doubleday.

3. LYCOREA ATERGATIS.

Lycorea atergatis, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 16. fig. 1 (1847).

Genus 3. ITUNA, Doubleday.

4. ITUNA LAMIRUS.

Heliconius lamirus, Latreille, in Humb. & Bonpl. Obs. Zool. ii. p. 126, pl. 41. figs. 7, 8 (1811 ?).

Section *Heliconoid Danainæ*.

Genus 4. OLYRAS, Doubleday.

5. OLYRAS INSIGNIS.

Olyras insignis, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. iv. p. 163. n. 1 (1869).

6. OLYRAS MONTAGUI.

Olyras montagui, Butler, Trans. Ent. Soc. p. 490 (1870); Lep. Exot. pl. 50. fig. 1 (1873).
Formerly received from Bogota.

Genus 5. THYRIDIA *, Bates.

7. THYRIDIA MELANTHO.

Thyridia melantho, Bates, Ent. Mo. Mag. iii. p. 50. n. 87 (1866). See Cist. Ent. pars vii. p. 151 (Oct. 1873).

Genus 6. CALLITHOMIA, Bates.

8. CALLITHOMIA HEZIA.

Ithomia hezia, Hewitson, Ex. Butt. i. *Ith.* pl. 4. fig. 21 (1853).

Genus 7. DIRCENNA, Doubleday.

9. DIRCENNA KLUGII.

Ceratinia klugii, Hübner, Zutr. ex. Schmett. figs. 801, 802 (1837).

10. DIRCENNA OLYRAS.

Ithomia olyras, Felder, Reise der Nov. Lep. ii. pl. 44. figs. 5, 6 ("1865").

11. DIRCENNA LONERA.

Dircenna lonera, Butler & Druce, Cist. Ent. v. p. 95 (July 1872); Lep. Exot. pl. 50. fig. 2 (1873).

12. DIRCENNA RELATA.

Dircenna relata, Butler & Druce, Cist. Ent. v. p. 95 (July 1872); Lep. Exot. pl. 50. fig. 3 (1873).
The two preceding species are both allied to *D. olyras*.

13. DIRCENNA GONUSSA.

Ithomia gonussa, Hewitson, Ex. Butt. i. *Ith.* pl. 16. fig. 100 (1855).
This has been confounded by some Lepidopterists with *I. sosunga* of Reakirt; the latter, however, belongs to the genus *Hymenitis*.

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* Cramer's figure of *T. psidii* is that of a common *Thyridia*, and quite distinct from the species figured by Bates, which appears to be an undescribed *Methona*, exactly copying it in coloration. The latter is in the British Museum; and the name of *M. confusa* has been given to it: this will prevent the necessity of confounding the two genera, as proposed by Mr. Kirby (Cat. p. 19).

14. DIRCENNA EUCHYTMA.

Ithomia euchytma, Felder, Reise der Nov. Lep. ii. p. 35
("1865").

15. DIRCENNA XENOS.

Dircenna xenos, Bates, Ent. Mo. Mag. iii. p. 50. n. 88 (

Genus 8. PTERONYMIA, Butler & Druce.

16. PTERONYMIA AZARA.

Ithomia azara, Hewitson, Ex. Butt. i. *Ith.* pl. 4. fig. 23

17. PTERONYMIA SIMPLEX.

Ithomia simplex, Salvin, Ann. & Mag. Nat. Hist. ser.
p. 168. n. 10 (1869).

18. PTERONYMIA ARTENA.

Ithomia artena, Hewitson, Ex. Butt. i. *Ith.* pl. 8. fig. 4

19. PTERONYMIA SALVINIA.

Ithomia salvinia, Bates, Ent. Mo. Mag. i. p. 34. n. 19 (
Obs. Seems to come very near to *I. gedera* of Hewitson.

20. PTERONYMIA PARVA.

Ithomia parva, Salvin, Ann. & Mag. Nat. Hist. ser. 4
p. 168. n. 11 (1869).

21. PTERONYMIA OLYRILLA.

Pteronymia olyrilla, Butler & Druce, Cist. Ent. v. p.
1872); Lep. Exot. pl. 50. fig. 6 (1873).

22. PTERONYMIA NOTILLA.

Pteronymia notilla, Butler & Druce, Cist. Ent. v. p.
1872); Lep. Exot. pl. 50. fig. 7 (1873).

23. PTERONYMIA FULVIMARGO.

Pteronymia fulvimargo, Butler & Druce, Cist. Ent. v. p.
1872); Lep. Exot. pl. 50. fig. 5 (1873).

24. PTERONYMIA LATILLA.

Ithomia latilla, Hewitson, Ex. Butt. i. pl. 6. fig. 32 (18

5. PTERONYMIA TUTIA.

omia tutia, Hewitson, Ex. Butt. i. *Ith.* pl. 2. fig. 6 (

Genus 9. ITHOMIA, Hübner.

26. ITHOMIA ADELPHINA, var.

Ithomia adelphina, Bates, Ent. Mo. Mag. iii. p. 52. n. 9
Ithomia virginiana (part), Hewitson, Ex. Butt. i. *It*
fig. 111 (1856).

27. **Ithomia patilla.**
Ithomia patilla, Hewitson, Ex. Butt. i. pl. 2. fig. 2 (1852).

28. **Ithomia terra.**
Ithomia terra, Hewitson, Ex. Butt. i. *Ith.* pl. 3. fig. 16 (1852).

29. **Ithomia hippocrenis.**
Ithomia hippocrenis, Bates, Ent. Mo. Mag. iii. p. 51. n. 89 (1866).
Allied to *I. avella* and *diasia* of Hewitson.

30. **Ithomia plaginota.**
Ithomia plaginota, Butler & Druce, Cist. Ent. v. p. 95 (July 1872); Lep. Exot. pl. 50. fig. 4 (1873).

31. **Ithomia heraldica.**
Ithomia heraldica, Bates, Ent. Mo. Mag. iii. p. 51. n. 90 (1866).

Genus 10. Hymenitis, Hübner.

32. **Hymenitis oto.**
Ithomia oto, Hewitson, Ex. Butt. i. *Ith.* pl. 7. fig. 39 (1854).

33. **Hymenitis nero.**
Ithomia nero, Hewitson, Ex. Butt. i. *Ith.* pl. 7. fig. 37 (1854).

34. **Hymenitis lyra.**
Ithomia lyra, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. iv. p. 169. n. 13 (1869).

35. **Hymenitis nephele.**
Ithomia nephele, Bates, Trans. Linn. Soc. xxiii. p. 548. n. 23 (1862).

36. **Hymenitis annetta.**
Heliconia annette, Guérin, Icon. Règne Anim. Ins. texte, p. 470 (1844).

37. **Hymenitis zavaletta.**
Ithomia zavaletta, Hewitson, Ex. Butt. i. *Ith.* pl. 9. fig. 49 (1854).

Genus 11. Leucothyris, Butler & Druce *.

38. **Leucothyris vicina.**
Ithomia vicina, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. iv. p. 169. n. 12 (1869).
Allied to *L. zea* and *L. makrena.*

39. **Leucothyris victorina.**
Heliconia victorine, Guérin, Ic. Règne Anim. Ins. texte, p. 470 (1844).
Ithomia victorina, Hewitson, Ex. Butt. i. *Ith.* pl. 13. fig. 75 (1855).

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* This is one of the most easily recognized of all the genera of the *Ithomia* group.

40. LEUCOTHYRIS CASSOTIS.

Ithomia cassotis, Bates, Ent. Mo. Mag. i. p. 35. n. 21 (1864

41. LEUCOTHYRIS RUBESCENS.

Leucothyris rubescens, Butler & Druce, Cist. Ent. v. p. 97 (18
Lep. Exot. pl. 50. fig. 9 (1873).

Genus 12. SCADA, Kirby (*Oleria*, Bates).

42. SCADA XANTHINA.

Oleria xanthina, Bates, Ent. Mo. Mag. iii. p. 52. n. 92 (18

43. SCADA ? EURIMEDIA.

Papilio eurimedia, Cramer, Pap. Exot. ii. pl. 126. figs.
(1779).

This species ought perhaps to form the type of a new genu
seems sufficiently distinct from *Scada* (*Oleria*, Bates).

Genus 13. CERATINIA, Hübner.

44. CERATINIA CALLISPILA.

Ceratinia callispila, Bates, Ent. Mo. Mag. iii. p. 85. n. 93 (1

45. CERATINIA FENESTELLA.

Ithomia fenestella, Hewitson, Ex. Butt. i. *Ith.* pl. 5. fi
(1854).

Genus 14. NAPEOGENES, Bates.

46. NAPEOGENES EXCELSA.

Ithomia excelsa, Felder, Wien. ent. Mon. vi. p. 415. n
(1862); Reise der Nov. Lep. ii. pl. 44. fig. 13 (1867)
tinia excelsa].

47. NAPEOGENES TOLOSA.

Ithomia tolosa, Hewitson, Ex. Butt. i. *Ith.* pl. 12. fig. 72 (1

Genus 15. MECHANITIS, Fabricius.

48. MECHANITIS ISTHMIA.

Mechanitis isthmia, Bates, Proc. Zool. Soc. p. 247. n. 18,
fig. 1 (1863).

49. MECHANITIS DORYSSUS.

Mechanitis doryssus, Bates, Ent. Mo. Mag. i. p. 33. n. 16 (

50. MECHANITIS MACRINUS.

Mechanitis macrinus, Hewitson, Ex. Butt. ii. *Mech.* pl. 3.
(1860).

Genus 16. MELINÆA, Hübner.

51. MELINÆA LILIS.

Mechanitis lilis, Doubleday & Hewitson, Gen. Diurn. Lepid.
fig. 4 (1847).

52. **MELINÆA SCYLAX.**

Mechanitis scylax, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. vii. p. 412. n. 33 (1871).

Genus 17. TITHOREA, Doubleday.

53. **TITHOREA DUENNA.**

Tithorea duenna, Bates, Ent. Mo. Mag. i. p. 56. n. 23 (1864).

54. **TITHOREA IRENE.**

Papilio irene, Drury, Ill. Ex. Ent. iii. pl. 38. fig. 1 (1782).

Subfamily SATYRINÆ, Bates.

Genus 18. TAYGETIS, Hübner.

55. **TAYGETIS MERMERIA.**

Papilio mermeria, Cramer, Pap. Exot. i. pl. 96. fig. B (1779).

56. **TAYGETIS CHRYSOGONE.**

Taygetis chrysogone, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 60. fig. 4 (1851).

57. **TAYGETIS LEUCTRA.**

Taygetis leuctra, Butler, Cist. Ent. i. p. 19. n. 3 (1870); Lep. Exot. pl. liii. fig. 3 (1873).

58. **TAYGETIS THAMYRA.**

Papilio thamyra, Cramer, Pap. Exot. iii. pl. 242. fig. B (1782).

59. **TAYGETIS SATYRINA.**

Taygetis satyrina, Bates, Ent. Mo. Mag. i. p. 179. n. 72 (1865).

60. **TAYGETIS UMBRACEA.**

Taygetis umbracea, Butler & Druce, Cist. Ent. v. p. 98 (July 1872); Lep. Exot. pl. liii. fig. 2 (1873).

61. **TAYGETIS INCERTA.**

Taygetis incerta, Butler & Druce, Cist. Ent. v. p. 98 (July 1872); Lep. Exot. pl. liii. fig. 1 (1873).

Genus 19. EUPTYCHIA, Hübner.

62. **EUPTYCHIA OCIRRHOË.**

Papilio ocirrhoë, Fabricius, Gen. Ins. p. 260. nn. 216, 217 (1776).
Oreas strigata ocyrrhoë, Hübner, Samml. ex. Schmett. (1806–16).

63. **EUPTYCHIA CAMERTA.**

Papilio camerta, Cramer, Pap. Exot. iv. pl. 295. fig. F (1782).

64. EUPTYCHIA PIERIA.

Euptychia pieria, Butler, Proc. Zool. Soc. p. 463. n. 13, pl. 39. fig. 3 (1866).

65. EUPTYCHIA USITATA.

Euptychia usitata, Butler, Proc. Zool. Soc. p. 463. n. 11, pl. 39. fig. 2 (1866).

66. EUPTYCHIA DISAFFECTA, n. sp.

Wings above olivaceous brown, outer margin slightly darker, fringe pale; secondaries with a well-defined subanal ocellus, white-pupilled, with testaceous iris; two submarginal slightly undulated blackish lines, and between the outer one and the margin a pale brown line: head and thorax blackish, abdomen paler brown; underside paler than above, densely but indistinctly irrorated with red-brown; base greyish: two central nearly straight transverse red-brown lines, slightly diverging to costa of primaries; area immediately beyond them pale; two slightly irregular submarginal dark-brown lines; outer margin black: secondaries with six small ocelli, the fifth largest; the first, second, and fifth black, white-pupilled, with indistinct testaceous iris; the others brown, only visible with the aid of a lens: body greyish brown. Expanse 1 inch 10 lines.

Nearly allied to *E. variabilis*, but differing entirely in the central lines on under surface, which are more like those of *E. usitata*; its natural position will be between *E. variabilis* and *E. angularis*.

67. EUPTYCHIA RENATA.

Papilio renata, Cramer, Pap. Exot. iv. pl. 326. fig. A (1782).

68. EUPTYCHIA FALLAX.

Neonympha fallax, Felder, Wien. ent. Mon. vi. p. 177. n. 157 (1862).

69. EUPTYCHIA HERMES.

Papilio hermes, Fabricius, Syst. Ent. p. 487. n. 195 (1775).
Oreas strigata canthe, Hübner, Samml. ex. Schmett. (1806–16).

70. EUPTYCHIA WESTWOODII.

Euptychia westwoodii, Butler, Proc. Zool. Soc. p. 481. n. 68, pl. 12. fig. 3 (1867).

71. EUPTYCHIA LIBYE.

Papilio libye, Linnæus, Syst. Nat. 1, ii. p. 772. n. 146 (1766); Sulzer, Gesch. Ins. p. 145, pl. 17. fig. 7 (1776).

72. EUPTYCHIA TIESSA.

Euptychia tiessa, Hewitson, Equat. Lep. p. 37. n. 67 (1869); Butler, Lep. Exot. i. pl. 18. fig. 4 (1870).

73. EUPTYCHIA ARNÆA.

Papilio arnæa, Fabricius, Gen. Ins. p. 260 (1777).
Papilio ebusa, Cramer, Pap. Exot. iv. pl. 292. figs. F, G (1782).

74. EUPTYCHIA PYRACMON.

Euptychia pyracmon, Butler, Proc. Zool. Soc. p. 499. n. 118 (1866), pl. 11. fig. 10 (1867).

75. EUPTYCHIA ITHAMA.

Euptychia ithama, Butler, Lep. Exot. i. pl. 4. fig. 4 (1869).

76. EUPTYCHIA ARGENTELLA.

Euptychia argentella, Butler & Druce, Cist. Ent. v. p. 98 (July 1872).

77. EUPTYCHIA INSOLATA.

Euptychia insolata, Butler & Druce, Cist. Ent. v. p. 99 (July 1872).

Genus 20. CALLITÆRA [*], Butler.

78. CALLITÆRA MENANDER.

Papilio menander, Drury, Ill. Ex. Ent. iii. pl. 38. fig. 3 (1782).

Genus 21. HETÆRA, Fabricius.

79. HETÆRA DIAPHANA.

Hætera diaphana, Lucas, in Ramon de la Sagra's Hist. de l'Ile de Cuba (Insectes), p. 587 (1857).

A specimen of this species from Costa Rica, only differing from ordinary examples in its slightly superior size, is in the collection of H. Druce, Esq.

Genus 22. PIERELLA, Westwood.

80. PIERELLA LUNA.

Papilio luna, Fabricius, Ent. Syst. 3, i. p. 109. n. 336 (1793).

81. PIERELLA HELVINA.

Hætera helvina, Hewitson, Ex. Butt. ii. pl. xlii. fig. 4 (1860).

Genus 23. PEDALIODES, Butler.

82. PEDALIODES PERPERNA.

Pronophila perperna, Hewitson, Trans. Ent. Soc. ser. 3, vol. i. p. 16. n. 39 (1862).

83. PEDALIODES MANIS.

Pronophila manis, Felder, Reise der Nov. Lep. iii. p. 469. n. 799 (1867).

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[*] In Kirby's Catalogue, p. 36, this genus is sunk as a synonym of *Citharias*, a genus equivalent to *Hetæra* of Fabricius, and as such rejected in Westwood and Hewitson's 'Genera of Diurnal Lepidoptera.' It contained four species (the first and last of which are not *Callitæræ*), and possessed no certain type.

84. **PEDALIODES HULDA.**

Pedaliodes hulda, Butler & Druce, Cist. Ent. v. p. 99 (July 1872).

85. **PEDALIODES LITHOCHALCIS.**

Pedaliodes lithochalcis, Butler & Druce, Cist. Ent. v. p. 100 (July 1872).

Genus 24. OXEOSCHISTUS, Butler.

86. **OXEOSCHISTUS PUERTA.**

Pronophila puerta, Westwood, Gen. Diurn. Lepid. p. 358. n. 3 note (1851); Hewitson, Ex. Butt. ii. *Pron.* pl. 2. fig. 12 (1860).

87. **OXEOSCHISTUS EURIPHYLE.**

Oxeoschistus euriphyle, Butler, Cist. Ent. iv. p. 73 (Jan. 1872); Lep. Exot. pl. lxii. fig. 6 (1874).

88. **OXEOSCHISTUS SUBMACULATUS**, n. sp.

Closely allied to *O. simplex*, rather larger; the tawny band above broader, the ocellate spots obsolescent; below the central band of secondaries rather broader, and the dentate silvery area towards apex more restricted, the external dentes not encroaching so far into the marginal border. Expanse of wings 3 inches 1 line.

If the species of *Oxeoschistus* showed any tendency to vary, this might be considered a variety of *O. simplex*.

89. **OXEOSCHISTUS COTHON.**

Oxeoschistus cothon, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. vii. p. 413. n. 37 (1869).

Genus 25. DRUCINA, Butler.

90. **DRUCINA LEONATA.**

Drucina leonata, Butler, Cist. Ent. iv. p. 72 (Jan. 1872); Lep. Exot. pl. xlix. fig. 5 (1873).

This was one of the most remarkable of the novelties sent home by Dr. Van Patten.

Genus 26. PRONOPHILA, Westwood.

91. **PRONOPHILA TIMANTHES.**

Pronophila timanthes, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. vii. p. 412. n. 36 (1869).

Genus 27. TISIPHONE, Hübner.

92. **TISIPHONE HERCYNA.**

Tisiphone hercyna, Hübner, Samml. ex. Schmett. (1816–24).

Genus 28. CALIGO, Hübner.

93. **CALIGO OILEUS.**

Pavonia oileus, Felder, Wien. ent. Mon. v. p. 111. n. 106 (1861); Reise der Nov. Lep. iii. pl. 65. fig. 2 (1867).

94. **CALIGO MEMNON.**

Pavonia memnon, Felder, Reise der Nov. Lep. iii. p. 454. n. 753 (1867).

95. **CALIGO EURYLOCHUS.**

Papilio eurilochus, Cramer, Pap. Exot. i. pl. 33. fig. A, pl. 34. fig. A (1775).

96. **CALIGO BUBOCULA.**

Caligo bubocula, Butler, Cist. Ent. iv. p. 74 (Jan. 1872).

97. **CALIGO AUTOMEDON.**

Papilio automedon, Cramer, Pap. Exot. i. pl. 41. figs. A, B (1776).

Genus 29. DYNASTOR, Westwood.

98. **DYNASTOR STYGIANUS.**

Dynastor stygianus, Butler, Cist. Ent. iv. p. 73 (Jan. 1872); Lep. Exot. pl. 47. fig. 1 (Jan. 1873).

Genus 30. OPSIPHANES, Westwood.

99. **OPSIPHANES CASSIÆ.**

Papilio cassiæ, Linnæus, Mus. Lud. Ulr. p. 265 (1764); Cramer, Pap. Exot. ii. pl. 106. fig. A (1779).

Subfamily MORPHINÆ, Butler.

Genus 31. MORPHO, Fabricius.

100. **MORPHO AQUARIUS.**

Morpho aquarius, Butler, Cist. Ent. iv. p. 74 (Jan. 1872); Lep. Exot. pl. 41. fig. 1 (July 1872).

Morpho cypris and *sulkowskyi*, also in the collection, were, I believe, obtained from Bogota.

101. **MORPHO MARINITA.**

♂ ♀. *Morpho marinita*, Butler, Cist. Ent. iv. p. 75 (Jan. 1872); Lep. Exot. pl. 41. fig. 2 (July 1872).

102. **MORPHO PELEIDES.**

Morpho peleides, Kollar, Denkschr. Akad. Wien. math.-nat. Cl. i. p. 356. n. 14 (1850).

103. **MORPHO AMATHONTE.**

Morpho amathonte, Deyrolle, Ann. Soc. Ent. France, p. 211 (1860).

It seems doubtful whether this is distinct from *M. menelaus*.

104. **MORPHO HYDORINA.**

♂ ♀. *Morpho hydorina*, Butler, Cist. Ent. iv. p. 76 (Jan. 1872); Lep. Exot. pl. 42. fig. 2 (Oct. 1872).

Var. ♂. *Morpho limpida*, Butler, Cist. Ent. iv. p. 75 (Jan. 1872).

Subfamily NYMPHALINÆ, Bates.

Genus 32. SIDERONE, Hübner.

105. SIDERONE THEBAIS.

Siderone thebais, Felder, Wien. ent. Mon. vi. p. 422. n. 132 (1862); Reise der Nov. Lep. iii. pl. 60. figs. 6, 7 (1867).

Genus 33. PAPHIA, Fabricius.

106. PAPHIA ELECTRA.

Paphia electra, Westwood, Gen. Diurn. Lepid. p. 319. n. 12, note (1850); Hewitson, Ex. Butt. i. *Paph.* & *Sider.* figs. 1, 2 (1856).

107. PAPHIA XENOCLES.

Paphia xenocles, Westwood, Gen. Diurn. Lepid. p. 319. n. 11 note (1850).

108. PAPHIA HERBACEA.

Paphia herbacea, Butler & Druce, Cist. Ent. v. p. 100 (July 1872); Lep. Exot. pl. lx. fig. 3 (1874).

109. PAPHIA GLAUCE.

Nymphalis glauce, Felder, Wien. ent. Mon. vi. p. 119. n. 132 (1862).

110. PAPHIA INDIGOTICA.

Paphia indigotica, Salvin, Ann. Nat. Hist. ser. 4, vol. iv. p. 180. n. 30 (1869).

111. PAPHIA PROSERPINA ♀?.

♂. *Paphia proserpina*, Salvin, Ann. Nat. Hist. ser. 4, vol. iv. p. 181. n. 32 (1869).

112. PAPHIA PITHYUSA.

Nymphalis pithyusa, Felder, Verh. zool.-bot. Ges. Wien, p. 473. n. 27 (1869).
Paphia eubæna, Boisduval, Lép. Guat. p. 50 (1870).

113. PAPHIA CHRYSOPHANA.

Paphia chrysophana, Bates, Ent. Mo. Mag. iii. p. 152. n. 109 (1866).

114. PAPHIA TITAN.

Nymphalis titan, Felder, Reise der Nov. Lep. iii. p. 447. n. 731, pl. 60. fig. 4 (1867).

115. PAPHIA CHÆRONEA.

Nymphalis chæronea, Felder, Wien. ent. Mon. v. p. 110. n. 104 (1861); Reise der Nov. Lep. iii. pl. 60. fig. 1 (1867).

116. PAPHIA RYPHEA.

Papilio ryphea, Cramer, Pap. Exot. i. pl. 48. figs. G, H (1779).

117. PAPHIA HELIE.

Papilio helie, Linnæus, Syst. Nat. 1, ii. p. 773. n. 152 (1766); Clerck's Icones, pl. 34. fig. 3 (1764).

118. PAPHIA GLYCERIUM.

Paphia glycerium, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 50. fig 1 (1850).

119. PAPHIA AMENOPHIS.

Nymphalis amenophis, Reise der Nov. Lep. iii. p. 449. n. 735 (1867).

120. PAPHIA IPHIS.

Nymphalis iphis, Latreille, Humb. Bonpl. Obs. Zool. ii. p. 80 (1811–23).

Nymphalis thamyris, Latreille, *l. c.* pl. 36. figs. 3, 4 (1811–23).

121. PAPHIA ŒNOMAIS.

Paphia œnomais, Boisduval, Lép. Guat. p. 51 (1870).

Genus 34. PROTOGONIUS, Hübner.

122. PROTOGONIUS CECROPS.

Protogonius cecrops, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 49. fig. 2 (1850).

Genus 35. PYCINA, Westwood.

123. PYCINA ZAMBA.

Pycina zamba, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 48. fig. 3 (1850).

Genus 36. AGANISTHOS, Boisduval.

124. AGANISTHOS ODIUS.

Papilio odius, Fabricius, Syst. Ent. p. 457. n. 60 (1775); Sulzer, Gesch. Ins. pl. 13. fig. 2 (1776).

Genus 37. MEGISTANIS, Westwood.

125. MEGISTANIS ACHERONTA.

Papilio acheronta, Fabricius, Syst. Ent. p. 501. n. 249 (1775).

Papilio cadmus, Cramer, Pap. Exot. i. pl. 22. figs. A, B (1779).

Kirby has referred this species, perhaps rightly, to the genus *Aganisthos*; in general appearance it is more like *A. odius* than the other species of *Megistanis*; a careful examination of its structure, however, will doubtless settle the question at once.

Genus 38. PREPONA, Boisduval.

126. PREPONA AMPHIMACHUS.

Papilio amphimachus, Fabricius, Syst. Ent. p. 457. n. 59 (1775); Boisduval, Cuv. Règne Anim. Ins. ii. pl. 139 bis. fig. 2 (1836).

127. **PREPONA DEMOPHON.**

Papilio demophon, Linnæus, Mus. Lud. Ulr. p. 215 (1764); Clerck's Icones, pl. 29. fig. 2, pl. 42. fig. 3 (1764).

128. **PREPONA MEANDER.**

Papilio meander, Cramer, Pap. Exot. i. pl. 12. figs. A, B (1775).

Genus 39. APATURA, Fabricius.

129. **APATURA LAURENTIA.**

Nymphalis laurentia, Godart, Enc. Méth. ix. p. 376. n. 86 (1823); Lucas, Lép. Exot. pl. 68. fig. 2 (1835).

130. **APATURA LUCASII.**

Apatura lucasii, Doubleday and Hewitson, Gen. Diurn. Lepid. pl. 45. fig. 2 (1850).

131. **APATURA DRURYI.**

Catargyria druryi, Hübner, Samml. ex. Schmett. (1816–41).

132. **APATURA PLESAURINA.**

Apatura plesaurina, Butler & Druce, Cist. Ent. v. p. 102 (July 1872); Lep. Exot. pl. lx. fig. 4 (1874).

An interesting mimic of *Heterochroa plesaure*. Dr. Boisduval refers the tropical-American species to a new genus (*Chlorippe*) on account of the green palpi; this character, however, fails in the present species, and therefore is proved to be useless.

133. **APATURA PAVONII.**

Nymphalis pavonii, Humboldt, Bonpl. Obs. Zool. i. p. 197, pl. 18. figs. 3, 4 (1811?).

Both sexes of this species came in Van Patten's collection.

Genus 40. HETEROCHROA, Boisduval.

134. **HETEROCHROA PLESAURE.**

Adelpha plesaure, Hübner, Zutr. ex. Schmett. figs. 231, 232 (1823).

135. **HETEROCHROA BASILEA.**

Papilio basilea, Cramer, Pap. Exot. ii. pl. 188. fig. D (1779).

136. **HETEROCHROA IPHICLA.**

Papilio iphicla, Linnæus, Mus. Lud. Ulr. p. 311 (1764); Cramer, Pap. Exot. ii. pl. 188. fig. D (1779).

137. **HETEROCHROA EROTIA.**

Heterochroa erotia, Hewitson, Ann. & Mag. Nat. Hist. xx. p. 259, pl. 20. fig. 3 (1847).

138. HETEROCHROA LERNA.

Heterochroa lerna, Hewitson, Ann. & Mag. Nat. Hist. xx. p. 257, pl. 20. fig. 4 (1847).

139. HETEROCHROA FESSONIA.

Heterochroa fessonia, Hewitson, Ann. & Mag. Nat. Hist. xx. p. 260, pl. 20. fig. 6 (1847).

140. HETEROCHROA MELANTHO.

Heterochroa melantho, Bates, Ent. Mo. Mag. i. p. 129. n. 57 (1864).

141. HETEROCHROA DEMIALBA.

Heterochroa demialba, Butler, Cist. Ent. iv. p. 77 (Jan. 1872); Lep. Exot. xii. pl. 38. fig. 3 (April 1872).

142. HETEROCHROA TRACTA.

Heterochroa tracta, Butler, Lep. Exot. xii. pl. 38. fig. 6 (1872).

143. HETEROCHROA LACINA.

Heterochroa lacina, Butler, Lep. Exot. xii. pl. 38. fig. 5 (1872).

144. HETEROCHROA FELDERI.

Heterochroa felderi, Boisduval, Lép. Guat. p. 45 (1870).

Genus 41. CATAGRAMMA, Boisduval.

145. CATAGRAMMA PACIFICA.

Catagramma pacifica, Bates, Ent. Mo. Mag. iii. p. 135. n. 105 (1866).

146. CATAGRAMMA LYCA.

Catagramma lyca, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 28. fig. 4 (1847).

147. CATAGRAMMA ATACAMA.

Catagramma atacama, Hewitson, Ex. Butt. i. *Cat.* pl. 1. figs. 1, 2 (1852).

148. CATAGRAMMA FAUSTINA.

Catagramma faustina, Bates, Ent. Mo. Mag. iii. p. 134. n. 103 (1866).

149. CATAGRAMMA TITANIA.

Catagramma titania, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. iv. p. 177. n. 25 (1869).

150. CATAGRAMMA PATELINA.

Catagramma patelina, Hewitson, Ex. Butt. i. *Cat.* pl. 2. figs. 13, 14 (1853).

Genus 42. Callicore, Hübner.

151. Callicore astala.

Catagramma astala, Guérin, Icon. Règne Anim. Ins. texte, p
(1844).

152. Callicore euclides.

Erycina euclides, Latreille in Humb. Bonpl. Obs. Zool. i. p.
pl. 24. figs. 3, 4 (1811?).

153. Callicore eupepla.

Callicore eupepla, Salvin and Godman, Ann. & Mag. Nat.
ser. 4, vol. ii. p. 146 (1868).
Quite distinct from *C. meridionalis*.

Genus 43. Eubagis, Boisduval.

154. Eubagis tithia.

Sevenia tithia, Hübner, Zutr. ex. Schmett. figs. 391, 392 (1

155. Eubagis mylitta.

Papilio mylitta, Cramer, Pap. Exot. iii. pl. 253. figs. D, E (1

156. Eubagis dyonis.

Dynamine dyonis, Hübner, Zutr. ex. Schmett. figs. 871,
(1837).

157. Eubagis egaea.

Papilio egaea, Fabricius, Syst. Ent. p. 496. n. 231 (1775);
novan, Nat. Rep. i. pl. 12 (1823).

158. Eubagis salpensa.

Eubagis salpensa, Felder, Wien. ent. Monatschr. vi. p. 113.
(1862).
There are specimens in the British Museum from Bogota
Venezuela.

159. Eubagis thalassina.

Eubagis thalassina, Boisduval, Lép. Guat. p. 41 (1870).

Genus 44. Nica, Hübner.

160. Nica flavilla.

Nymphalis flavilla, Godart, Enc. Méth. ix. p. 406. n. 185 (1
Nica flavilla, Hübner, Samml. ex. Schmett. (1816–24).

Genus 45. Ectima, Doubleday.

161. Ectima liria.

Papilio liria, Fabricius, Ent. Syst. 3, i. p. 239. n. 747 (17
Donovan, Ins. Ind. pl. 37. fig. 5 (1800).

162. **Ectima rectifascia**, n. sp.

Allied to *E. liria*; differs in its greater size, in the narrower oblique band of primaries, with a sharply defined uninterrupted inner edge; the ocelli of primaries larger and better-defined on both surfaces; the outer margin nearly straight; markings below broader and deeper in colour. Expanse 2 inches 1 line.

A well-marked and interesting species, differing entirely from all the known forms in the shape of the band of the primaries.

Genus 46. **Amphirene**, Hübner.

163. **Amphirene epaphus.**

Vanessa epaphus, Latreille in Humb. Bonpl. Obs. Zool. ii. p. 74, pl. 35. figs. 3, 4 (1811–19).

164. **Amphirene superba.**

Amphirene superba, Bates, Ent. Mo. Mag. i. p. 161. n. 61 (1864).

Some examples have a good deal of red towards apex of front wings.

Genus 47. **Victorina**, Blanchard.

165. **Victorina steneles.**

Papilio steneles, Linnæus, Mus. Lud. Ulr. p. 218 (1764); Clerck's Icones, pl. 35. fig. 2 (1764).

Genus 48. **Marpesia**, Hübner.

166. **Marpesia peleus.**

Papilio peleus, Sulzer, Gesch. Ins. pl. 13. fig. 4 (1776).

Genus 49. **Megalura**, Blanchard.

167. **Megalura coresia.**

Nymphalis coresia, Godart, Enc. Méth. ix. p. 359. n. 31 (1823).
Marpesia zerynthia, Hübner, Samml. ex. Schmett. 1816–24.

168. **Megalura chiron.**

Papilio chiron, Fabricius, Syst. Ent. p. 452. n. 40 (1775).
Papilio marius, Cramer, Pap. Exot. iii. pl. 200. figs. D, E (1780).

169. **Megalura berania.**

Timetes berania, Hewitson, Ex. Butt. i. *Tim.* pl. 1. fig. 1 (1852).

170. **Megalura merops.**

Tymetes merops, Boisduval, Cuv. Règne Anim. Ins. ii. pl. 139. fig. 1 (1836).

171. **Megalura corita.**

Timetes corita, Westwood, Gen. Diurn. Lepid. p. 263 (1850).

172. **Megalura valetta.**

♀. *Megalura valetta*, Butler & Druce, Cist. Ent. v. p. 101 (July 1872); Lep. Exot. pl. lx. fig. 2 (1874).

173. **MEGALURA IOLE.**

Papilio iole, Drury, Ill. Ex. Ent. iii. pl. 38. fig. 2 (1782).

Genus 50. HYPANARTIA, Hübner.

174. **HYPANARTIA LETHE.**

Papilio lethe, Fabricius, Ent. Syst. 3, i. p. 80. n. 250 (1793); Donovan, Ins. Ind. pl. 23. fig. 1 (1800).

175. **HYPANARTIA GODMANII.**

Eurema godmanii, Bates, Ent. Mo. Mag. i. p. 85. n. 44 (1864).
Eurema atropos, Felder, Reise der Nov. Lep. iii. p. 397. n. 588, pl. 51. figs. 5, 6 (1867).

176. **HYPANARTIA KEFERSTEINII.**

Eurema kefersteinii, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 24. fig. 4 (1848).

177. **HYPANARTIA ARCÆI.**

Eurema arcæi, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. vii. p. 415. n. 45 (1869).

Genus 51. ANARTIA, Hübner.

178. **ANARTIA FATIMA.**

Papilio fatima, Fabricius, Ent. Syst. 3, i. p. 81. n. 252 (1793); Donovan, Ins. Ind. pl. 31. fig. 2 (1800).

179. **ANARTIA JATROPHÆ.**

Papilio jatrophæ, Linnæus, Mus. Lud. Ulr. p. 289 (1764); Cramer, Pap. Exot. iii. pl. 202. figs. E, F (1782).

Genus 52. JUNONIA, Hübner.

180. **JUNONIA PALLENS.**

Junonia pallens, Felder, Reise der Nov. Lep. iii. p. 401. n. 597 (1867).

Genus 53. PYRAMEIS, Hübner*.

181. **PYRAMEIS CARDUI.**

Papilio cardui, Linnæus, Faun. Suec. p. 276. n. 1054 (1761).

182. **PYRAMEIS CARYE.**

Ham. dec. Carye, Hübner, Samml. ex. Schmett. (1806–16).

Genus 54. EPIPHILE, Doubleday.

183. **EPIPHILE ADRASTA.**

Epiphile adrasta, Hewitson, Ex. Butt. ii. *Epiph.* pl. 2. figs. 9–11 (1861).

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* This genus will probably become a synonym of *Nymphalis*. See Crotch in Cist. Ent. iv. p. 60.

184. **EPIPHILE GRANDIS.**

Epiphile grandis, Butler, Cist. Ent. iv. p. 76 (Jan. 1872); Lep. Exot. pl. liv. fig. 4 (1873).

Genus 55. **TEMENIS**, Hübner.

185. **TEMENIS ARIADNE.**

Papilio ariadne, Cramer, Pap. Exot. ii. pl. 180. figs. E, F (1779).

Genus 56. **MYSCELIA.**

186. **MYSCELIA PATTENIA.**

Myscelia pattenia, Butler & Druce, Cist. Ent. v. p. 101 (July 1872); Lep. Exot. pl. lx. fig. 1 (1874).

Genus 57. **EPICALIA**, Westwood.

187. **EPICALIA NYCTIMUS.**

Epicalia nyctimus, Westwood, Gen. Diurn. Lepid. p. 257. n. 1 (1850); Hewitson, Ex. Butt. i. *Epic.* pl. 2. figs. 5, 6 (1852).

188. **EPICALIA PIERRETII.**

Epicalia pierretii, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 29. fig. 4 (1850).

189. **EPICALIA OBRINUS.**

Papilio obrinus, Linnæus, Mus. Lud. Ulr. p. 255 (1764); Clerck's Icones, pl. 31. figs. 2, 3 (1764).

Genus 58. **AGERONIA**, Hübner.

190. **AGERONIA FERONIA.**

Papilio feronia, Linnæus, Mus. Lud. Ulr. p. 283 (1764); Clerck's Icones, pl. 31. fig. 1 (1764).

191. **AGERONIA FORNAX.**

Ageronia fornax, Hübner, Samml. ex. Schmett. (1816–24); Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 10. fig. 1 (1847).

192. **AGERONIA AMPHINOME.**

Papilio amphinome, Linnæus, Syst. Nat. 1, ii. p. 779. n. 176 (1766); Cramer, Pap. Exot. i. pl. 54. figs. E, F (1779).

193. **AGERONIA ŒNOË.**

Ageronia œnoë, Boisduval, Lép. Guat. p. 26 (1870).

Genus 59. **DIDONIS**, Hübner.

194. **DIDONIS PASIRA.**

Didonis pasira, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 31. fig. 2 (1848).

Genus 60. SMYRNA, Hübner.

195. **SMYRNA BLOMFILDIA.**

Papilio blomfildia, Fabricius, Sp. Ins. ii. p. 84. n. 370 (1781); Hübner, Samml. ex. Schmett. (1816–41).

Genus 61. PYRRHOGYRA, Hübner.

196. **PYRRHOGYRA EDOCLA.**

Pyrrhogyra edocla, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 32. fig. 5 (1850).

197. **PYRRHOGYRA OTOLAIS.**

Pyrrhogyra otolais, Bates, Ent. Mo. Mag. i. p. 126. n. 52 (1864).

P. neis of Felder seems identical with this species.

Genus 62. MICROTIA, Bates.

198. **MICROTIA ELVA.**

Microtia elva, Bates, Ent. Mo. Mag. i. p. 83. n. 39 (1864).

Genus 63. PHYCIODES, Hübner.

199. **PHYCIODES CLAUDINA.**

Acræa claudina, Eschscholtz, Kotzeb. Reise, iii. p. 212, pl. 8. figs. 18 *a*, *b* (1821).

200. **PHYCIODES NIVEONOTIS.**

Phyciodes niveonotis, Butler & Druce, Cist. Ent. v. p. 100 (July 1872).

201. **PHYCIODES? NIGRIPENNIS.**

Eresia nigripennis, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. iv. p. 170. n. 14 (1869).

202. **PHYCIODES CRITHONA.**

Melitæa crithona, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. vii. p. 415. n. 46 (Sept. 1869).

203. **PHYCIODES HERA.**

Papilio hera, Cramer, Pap. Exot. iii. pl. 253. figs. F, G (1782).

204. **PHYCIODES ARDYS.**

Eresia ardys, Hewitson, Ex. Butt. iii. *Eres.* pl. 5. figs. 35, 36 (1864).

205. **PHYCIODES OTANES.**

Eresia otanes, Hewitson, Ex. Butt. iii. *Eres.* pl. 6. fig. 47 (1864).

206. **PHYCIODES FULVIPLAGA.**

Phyciodes fulviplaga, Butler, Cist. Ent. iv. p. 77 (1872); Lep. Exot. pl. lxiii. fig. 2 (1874).

This species is very distinct from any species previously known.

Genus 64. CLOTHILDA, Blanchard.

207. **CLOTHILDA INSIGNIS.**

Clothilda insignis, Salvin, Trans. Ent. Soc. p. 394. n. 4 (1869).

Genus 65. EUNICA, Hübner.

208. **EUNICA ANNA.**

Papilio anna, Cramer, Pap. Exot. iii. pl. 251. figs. A, B (1782).

209. **EUNICA AUGUSTA.**

Eunica augusta, Bates, Ent. Mo. Mag. iii. p. 135. n. 106 (1866).

Genus 66. CYCLOGRAMMA, Doubleday.

210. **CYCLOGRAMMA PANDAMA.**

Cybdelis pandama, Doubleday & Hewitson, Gen. Diurn. Lepid. p. 219, pl. 27. fig. 5 (1848).

Genus 67. CHLOSYNE, Butler.

211. **CHLOSYNE LACINIA.**

Araschnia lacinia, Hübner, Zutr. ex. Schmett. figs. 899, 900 (1837).

212. **CHLOSYNE JANAIS.**

Papilio janais, Drury, Ill. Ex. Ent. iii. pl. 17. figs. 5, 6 (1782).

213. **CHLOSYNE ERODYLE.**

Synchloë erodyle, Bates, Ent. Mo. Mag. i. p. 84. n. 41 (1864).

214. **CHLOSYNE HIPPODROME.**

Araschnia hippodrome, Hübner, Zutr. ex. Schmett. figs. 863, 864 (1837).

215. **CHLOSYNE NARVA.**

Papilio narva, Fabricius, Ent. Syst. 3, i. p. 249. n. 775 (1793).

216. **CHLOSYNE GAUDIALIS.**

Synchloë gaudialis, Bates, Ent. Mo. Mag. i. p. 84. n. 40 (1864).

Genus 68. EUPTOIETA, Doubleday.

217. **EUPTOIETA HEGESIA.**

Papilio hegesia, Cramer, Pap. Exot. iii. pl. 209. figs. E, F. (1782).

Genus 69. DIONE, Hübner*.

218. **DIONE MONETA.**

Dione moneta, Hübner, Samml. ex. Schmett. (1816–24).
Agraulis glycera, Felder, Wien. ent. Mon. v. p. 102. n. 75 (1861).

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* All the species of this genus are congeneric, so that *Agraulis* is a synonym. Mr. Wallace's objection respecting the value of Hübner's descriptions has no weight; it is enough that the genera were described.

219. Dione vanillæ.

Papilio vanillæ, Linnæus, Mus. Lud. Ulr. p. 306
Clerck's Icones, pl. 40. fig. 2 (1764).

220. Dione juno.

Papilio juno, Cramer, Pap. Exot. iii. pl. 215. figs. B, C

Genus 70. Colænis, Hübner.

221. Colænis phærusa.

Papilio phærusa, Linnæus, Mus. Lud. Ulr. p. 293 (17
Papilio phærusa, Cramer, Pap. Exot. ii. pl. 130.
(1779).

222. Colænis julia.

Papilio julia, Fabricius, Syst. Ent. p. 509. n. 281
Hübner, Samml. ex. Schmett. (1806–16).

223. Colænis delila.

Papilio delila, Fabricius, Syst, Ent. p. 510. n. 284 (17
Papilio cellene, Cramer, Pap. Exot. iii. pl. 215. figs. D,

Genus 71. Eresia, Boisduval.

224. Eresia eunice.

Nereis fulva eunice, Hübner, Samml. exot. Schmett. (1

225. Eresia dismorphina.

Eresia dismorphina, Butler, Cist. Ent. iv. p. 78 (Jan. 18
Exot. pl. lxiii. fig. 1 (1874).

226. Eresia eranites.

Eresia eranites, Hewitson, Ex. Butt. ii. *Eres.* pl. 2.
(1857).

227. Eresia nauplia.

Papilio nauplia, Linnæus, Mus. Lud. Ulr. p. 309 (1764)
Icones, pl. 46. fig. 1 (1764).

Subfamily Heliconinæ, Bates.

Genus 72. Eueides, Hübner.

228. Eueides lineata.

Eueides lineata, Salvin and Godman, Ann. & Mag.
ser. 4, vol. ii. p. 145. n. 9 (1868).

229. Eueides vibilia.

Cethosia vibilia, Godart, Enc. Méth. ix. p. 245. n.
Hübner, Zutr. ex. Schm. figs. 449, 450 (1825) [*Colænis*

230. EUEIDES CLEOBÆA.

Eueides cleobæa, Hübner, Zutr. ex. Schm. figs. 601, 602 (1832).

231. EUEIDES VULGIFORMIS.

Eueides vulgiformis, Butler & Druce, Cist. Ent. v. p. 102 (July 1872).

Genus 73. HELICONIUS, Fabricius.

232. HELICONIUS CHARITHONIA.

Papilio charithonia, Linnæus, Syst. Nat. 1, ii. p. 757. n. 65 (1767); Cramer, Pap. Exot. ii. pl. 191. fig. F (1779).

233. HELICONIUS PACHINUS.

Heliconius pachinus, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. vii. p. 414. n. 42 (1871).

234. HELICONIUS GALANTHUS.

Heliconius galanthus, Bates, Ent. Mo. Mag. i. p. 58. n. 29 (1864).

235. HELICONIUS CYDNO.

Heliconia cydno, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 15. fig. 3 (1847).

236. HELICONIUS RHEA.

Papilio rhea, Cramer, Pap. Exot. i. pl. 54. figs. C, D (1779).

237. HELICONIUS PETIVERANA.

Heliconia petiverana, Doubleday, Gen. Diurn. Lepid. p. 103. n. 18 (1847).

238. HELICONIUS ERATO.

Papilio erato, Linnæus, Mus. Lud. Ulr. p. 231 (1764); Clerck's Icones, pl. 40. fig. 1 (1764).

239. HELICONIUS MONTANUS.

Heliconius montanus, Salvin, Ann. & Mag. Nat. Hist. ser. 4, vol. vii. p. 414. n. 41 (1871).

240. HELICONIUS ZULEIKA.

Heliconia zuleika, Hewitson, Ex. Butt. i. *Hel.* pl. 3. fig. 10 (1854).

241. HELICONIUS FORMOSUS.

Heliconius formosus, Bates, Ent. Mo. Mag. iii. p. 87. n. 96 (1866).

242. HELICONIUS TELCHINIA.

Heliconia telchinia, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 14. fig. 4 (1847).

243. HELICONIUS ROSINA.

Heliconia rosina, Boisduval, Lép. Guat. p. 29 (1870).

Subfamily Acræinæ, Bates.

Genus 74. Actinote, Hübner.

244. Actinote nox.

♂. *Acræa nox*, Bates, Ent. Mo. Mag. i. p. 59. n. 33 (1864).
♀. *Acræa leucomelas*, Bates, *l. c.* n. 32 (1864).
Acræa orizava, Reakirt, Proc. Acad. Nat. Sci. Phil. p. 243. n. 13 (1866).

Reakirt separated his *A. orizava* from *A. leucomelas* by characters which are purely individual and not locally constant.

245. Actinote thalia.

Papilio thalia, Linnæus, Mus. Lud. Ulr. p. 230 (1764); Clerck's Icones, pl. 43. fig. 2 (1764).

Family Erycinidæ, Swainson.

Subfamily Libytheinæ, Bates.

Genus 75. Libythea, Fabricius.

246. Libythea carinenta.

Papilio carinenta, Cramer, Pap. Exot. ii. pl. 108. figs. E, F (1779).

Subfamily Nemeobiinæ, Bates.

Genus 76. Eurybia, Hübner.

247. Eurybia juturna.

Eurybia juturna, Felder, Reise der Nov. Lep. ii. p. 288. n. 372 ("1865").

Genus 77. Mesosemia, Hübner.

248. Mesosemia lagora.

Diophthalma lagora, Herrich-Schäffer, Ex. Schmett. figs. 43, 44 (1853).

249. Mesosemia telegone.

Diophthalma telegone, Boisduval, Sp. Gén. Lép. i. pl. 21. fig. 2 (1836).

250. Mesosemia frequens.

Mesosemia frequens, Butler & Druce, Cist. Ent. v. p. 104 (July 1872).

Subfamily Eurygoninæ, Bates.

Genus 78. Eurygona (Boisd.), Westwood.

251. Eurygona chrysippe.

Eurygona chrysippe, Bates, Ent. Mo. Mag. iii. p. 154. n. 114 (1866).
Eurygona labiena, Hewitson, Ent. Mo. Mag. vi. p. 226 (1870).

252. Eurygona regipennis.

Eurygona regipennis, Butler & Druce, Cist. Ent. v. p. 103 (July 1872).

253. EURYGONA AURANTIA.

Eurygona aurantia, Butler & Druce, Cist. Ent. v. p. 103 (July 1872).

Seems to mimic *Nelo chrysomela*, a new moth in the same collection.

Genus 79. METHONELLA, Westwood.

254. METHONELLA CHRYSOMELA.

Methonella chrysomela, Butler, Cist. Ent. iv. p. 78 (Jan. 1872).

Previously in the collection of the British Museum from Bogota.

Subfamily ERYCININÆ, Bates.

Genus 80. LYMNAS, Blanchard.

255. LYMNAS PIXE.

Lymnas pixe, Boisduval, Sp. Gén. Lép. i. pl. 20. fig. 1 (1836).

Genus 81. HADES, Westwood.

256. HADES NOCTULA.

Hades noctula, Westwood & Hewitson, Gen. Diurn. Lepid. p. 435. n. 1, note, pl. 72. fig. 3 (1851).

Genus 82. ITHOMEIS, Bates.

257. ITHOMEIS EULEMA.

Ithomeis eulema, Hewitson, Ex. Butt. iv. *Erycin.* pl. 2. fig. 1 (1870).

Genus 83. ESTHEMOPSIS, Felder.

258. ESTHEMOPSIS CLONIA.

Esthemopsis clonia, Felder, Reise der Nov. Lep. ii. p. 306. n. 414, pl. 38. figs. 11, 12 (" 1865 ").

Genus 84. EMESIS, Fabricius.

259. EMESIS TENEDIA.

Emesis tenedia, Felder, Wien. ent. Mon. v. p. 99. n. 61 (1861).

260. EMESIS CYPRIA.

Emesis cypria, Felder, Wien. ent. Mon. v. p. 99. n. 62 (1861); Reise der Nov. Lep. ii. pl. 36. figs. 12, 13 (" 1865 ").

261. EMESIS OLIVÆ.

Emesis olivæ, Butler & Druce, Cist. Ent. v. p. 103 (July 1872).

262. EMESIS FUROR.

Emesis furor, Butler & Druce, Cist. Ent. v. p. 104 (July 1872).

Genus 85. CHARIS, Hübner.

263. CHARIS ARGYRODINES.

Charis argyrodines, Bates, Ent. Mo. Mag. iii. p. 154. n. 112 (1866).

Genus 86. LEMONIAS, Westwood.

264. **LEMONIAS ADELINA.**

Lemonias adelina, Butler, Cist. Ent. iv. p. 79 (Jan. 1872).

Section *Thisbe*, Hübner.

265. **LEMONIAS IRENÆA.**

♀. *Papilio irenæa*, Cramer, Pap. Exot. iv. pl. 328. figs. C, D (1782).
♂. *Papilio belise*, Cramer, *l. c.* pl. 376. figs. E, F (1782).

Genus 87. NYMPHIDIUM, Fabricius.

266. **NYMPHIDIUM LYCORIAS.**

Nymphidium lycorias, Hewitson, Ex. Butt. i. *Nymph.* pl. 1. figs. 7, 8 (1852).

267. **NYMPHIDIUM ASCOLIA.**

Nymphidium ascolia, Hewitson, Ex. Butt. i. *Nymph.* pl. 1. fig. 4 (1852).

Genus 88. PANDEMOS, Hübner.

268. **PANDEMOS NYMPHIDIOIDES.**

Pandemos nymphidioides, Butler, Cist. Ent. iv. p. 79 (Jan. 1872).

A very remarkable form brought home by Dr. van Patten; it is quite unlike any species previously known.

Family LYCÆNIDÆ, Stephens.

Subfamily LYCÆNINÆ, Butler.

Genus 89. EUMÆUS, Hübner.

269. **EUMÆUS MINYAS.**

Rusticus (*adolescens*) *minyas*, Hübner, Samml. ex. Schmett. (1806–16).

270. **EUMÆUS TOXANA.**

Eumæus toxana, Boisduval, Lép. Guat. p. 13 (1870).

Genus 90. LAMPIDES, Hübner.

271. **LAMPIDES CASSIUS.**

Papilio cassius, Cramer, Pap. Exot. i. pl. 23. figs. C, D (1775). *Lycæna marina* of Reakirt is evidently this species.

272. **LAMPIDES ZACHÆINA.**

Lampides zachæina, Butler & Druce, Cist. Ent. v. p. 104 (July 1872); Lep. Exot. pl. lxvii. fig. 1 (1873).

Subfamily THECLINÆ, Butler.

Genus 91. STRYMON, Hübner.

273. STRYMON PASTOR.

Strymon pastor, Butler & Druce, Cist. Ent. v. p. 105 (July 1872); Lep. Exot. pl. lvii. fig. 5 (1873).

274. STRYMON AGRICOLOR.

Strymon agricolor, Butler & Druce, Cist. Ent. v. p. 105 (July 1872); Lep. Exot. pl. lvii. fig. 4 (1873).

275. STRYMON CŒLICOLOR.

Strymon cœlicolor, Butler & Druce, Cist. Ent. v. p. 106 (July 1872); Lep. Exot. pl. lvii. fig. 6 (1873).

Genus 92. TMOLUS, Hübner.

276. TMOLUS TEMESA.

Thecla temesa, Hewitson, Descr. Lyc. p. 1. n. 2 (1868); Ill. Diurn. Lepid. pl. 52. figs. 284, 285 (1869).

277. TMOLUS TALAYRA.

Thecla talayra, Hewitson, Descr. Lyc. p. 1. n. 3 (1868); Ill. Diurn. Lepid. pl. 52. figs. 286, 287 (1869).

278. TMOLUS? GAUNA.

Thecla gauna, Boisduval, Lép. Guat. p. 16 (1870).

279. TMOLUS CROLINUS.

Tmolus crolinus, Butler & Druce, Cist. Ent. v. p. 107 (July 1872); Lep. Exot. pl. lvii. fig. 13 (1873).

280. TMOLUS INVISUS.

Tmolus invisus, Butler & Druce, Cist. Ent. v. p. 108 (July 1872); Lep. Exot. pl. lvii. fig. 12 (1873).

281. TMOLUS HALCIONES.

Tmolus halciones, Butler & Druce, Cist. Ent. v. p. 108 (July 1872); Lep. Exot. pl. lvii. fig. 9 (1873).

282. TMOLUS ISOBEON.

Tmolus isobeon, Butler & Druce, Cist. Ent. v. p. 108 (July 1872); Lep. Exot. pl. lvii. fig. 2 (1873).

283. TMOLUS VESPASIANUS.

Tmolus vespasianus, Butler & Druce, Cist. Ent. v. p. 109 (July 1872); Lep. Exot. pl. lvii. fig. 7 (1873).

284. TMOLUS CHARICHLORUS.

Tmolus charichlorus, Butler & Druce, Cist. Ent. v. p. 109 (July 1872); Lep. Exot. pl. lvii. fig. 10 (1873).

285. Tmolus denarius.

Tmolus denarius, Butler & Druce, Cist. Ent. v. p. 109 (July 1872); Lep. Exot. pl. lvii. fig. 3 (1873).

286. Tmolus vesulus.

Papilio vesulus, Cramer, Pap. Exot. iv. pl. 340. figs. I, K (1782).

Genus 93. Bithys, Hübner.

287. Bithys ? thara.

Thecla thara, Hewitson, Ill. Diurn. Lepid. p. 83. n. 56, pl. 32. figs. 45, 46 (1867).

288. Bithys azurinus.

Bithys azurinus, Butler & Druce, Cist. Ent. v. p. 107 (July 1872); Lep. Exot. pl. lvii. fig. 11 (1873).

289. Bithys hesperitis.

Bithys hesperitis, Butler & Druce, Cist. Ent. v. p. 107 (July 1872); Lep. Exot. pl. lvii. fig. 14 (1873).

Genus 94. Mithras, Hübner.

290. Mithras augustinus.

Mithras augustinus, Butler & Druce, Cist. Ent. v. p. 106 (July 1872); Lep. Exot. pl. lvii. fig. 8 (1873).

291. Mithras tolmides.

Pseudolycæna tolmides, Felder, Reise der Nov. Lep. ii. p. 247. n. 288, pl. 31. figs. 13, 14 ("1865").

292. Mithras desdemona.

Thecla desdemona, Hewitson, Ill. Diurn. Lepid. p. 79. n. 37, pl. 45. figs. 189, 190 (1867).

Close to *P. tolmides* and *ægides* of Felder.

293. Mithras ægides.

Pseudolycæna ægides, Felder, Reise der Nov. Lep. ii. p. 246. n. 286, pl. 31. figs. 3, 4 (1865).

294. Mithras ? calesia.

Thecla calesia, Hewitson, Equat. Lep. p. 67. n. 121 (1870).

Genus 95. Panthiades, Hübner.

295. Panthiades togarna.

Thecla togarna, Hewitson, Ill. Diurn. Lepid. p. 85. n. 65, pl. 33. figs. 52, 53 (1867).

296. Panthiades sito.

Thecla sito, Boisduval, Sp. Gén. Lép. i. pl. 22. fig. 5 (1836).

Family PAPILIONIDÆ.

Subfamily PIERINÆ, Bates.

Genus 96. PEREUTE, Herrich-Schäffer.

297. **PEREUTE CHAROPS.**

Euterpe charops, Boisduval, Sp. Gén. Lép. i. p. 407. n. 3, pl. 18. fig. 1 (1836).

Genus 97. MYLOTHRIS, Hübner.

298. **MYLOTHRIS MALENKA.**

Pieris malenka, Hewitson, Ex. Butt. i. *Pier.* pl. 1. figs. 5, 6 (1852).

299. **MYLOTHRIS ALETHINA.**

Mylothris alethina, Butler, Cist. Ent. iv. p. 81 (Jan. 1872).

300. **MYLOTHRIS VIARDI.**

Pieris viardi, Boisduval, Sp. Gén. Lép. i. p. 439. n. 3 (1836).

Genus 98. EUTERPE, Swainson.

301. **EUTERPE TEREAS.**

Papilio tereas, Godart, Enc. Méth. ix. p. 38. n. 39 (1819).
Euterpe terea, Swainson, Zool. Ill. Ins. ii. pl. 74 (1831).

302. **EUTERPE DISMORPHITES.**

Euterpe dismorphites, Butler, Cist. Ent. iv. p. 80 (Jan. 1872).

Genus 99. HESPEROCHARIS, Felder.

303. **HESPEROCHARIS CROCEA.**

Hesperocharis crocea, Bates, Ent. Mo. Mag. iii. p. 49. n. 84 (1866).

304. **HESPEROCHARIS COSTARICENSIS.**

Hesperocharis costaricensis, Bates, Ent. Mo. Mag. iii. p. 49. n. 85 (1866).

Genus 100. CATASTICTA, Butler.

305. **CATASTICTA OCHRACEA.**

Euterpe ochracea, Bates, Ent. Mo. Mag. i. p. 31 (1864).

306. **CATASTICTA NIMBICE.**

Euterpe nimbice, Boisduval, Sp. Gén. Lép. i. p. 409. n. 6 (1836); Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 5. fig. 1 (1847).

307. **CATASTICTA ARECHIZA.**

Euterpe arechiza, Reakirt, Proc. Acad. Nat. Sci. Philad. p. 244. n. 15 (1866).

This species formerly stood in the Museum and several other collections as the *E. teutila* of Doubleday, near to which it is placed in

Kirby's Catalogue, p. 430 (see nos. 9 & 11); the latter, however, is the male of *C. sebennica*. This error probably occurred in consequence of the type not being marked; whilst *C. arechiza* bore a label, in Mr. White's handwriting, with the name *C. teutila* inscribed thereon.

308. Catasticta potamea.

Euterpe potamea, Felder, Wien. ent. Mon. v. p. 78. n. 22 (1861).

309. Catasticta theresa, n. sp.

Wings above sepia-brown; primaries with a broad cuneiform patch cut by the median nervure and its first and second branches, which are broadly black-brown; two subcostal spots placed transversely beyond cell, and a discal series of four to five squamose discal spots, ochraceous clay-colour; secondaries with central area to near base (interrupted by black nervures), four additional small discal spots, and three or four along anal margin ochraceous clay-colour: body black-brown, a yellow spot on pterygodes; sides of abdomen white: wings below altogether paler; primaries with all the spots enlarged, whitish towards costa, streaked with sulphur-yellow towards apex; apex white; a marginal series of hastate yellow spots; secondaries brown at base, interrupted by yellow streaks; a cuneiform white spot from præcostal nervelet; a curved central white band, broadest on costa, streaked with yellow and cut by the black nervures; area immediately beyond forming an irregular ill-defined pale brown band across end of cell; a discal series of dark brown spots, on one or both sides of which are yellow spots, and beyond which are some pearly-whitish streaks; a marginal series of subtriangular yellow spots; base margined with scarlet; body black-brown; venter white, with blackish longitudinal streak. Expanse 1 inch 11 lines.

310. Catasticta sisamnus.

Papilio sisamnus, Fabricius, Ent. Syst. 3, i. p. 44. n. 131 (1793).
Euterpe pitana, Felder, Reise der Nov. Lep. ii. pl. 23. figs. 9, 10 (1865).

311. Catasticta actinotis.

Catasticta actinotis, Butler, Cist. Ent. iv. p. 80 (Jan. 1872); Lep. Exot. pl. xliii. fig. 6 (1872).

312. Catasticta emeris.

Euterpe emeris, Boisduval, Sp. Gén. Lép. i. p. 408. n. 5 (1836).

Genus 101. Sphænogona, Butler.

313. Sphænogona mexicana.

Terias mexicana, Boisduval, Sp. Gén. Lép. i. p. 655. n. 3, pl. 19. fig. 1 (1836).

314. Sphænogona limonea.

Terias limoneus, Felder, Wien. ent. Mon. v. p. 84. n. 43 (1861).

315. **Sphænogona fabiola.**

Terias fabiola, Felder, Wien. ent. Mon. v. p. 85. n. 44 (1861).

316. **Sphænogona constantia.**

Terias constantia, Felder, Reise der Nov. Lep. ii. p. 200. n. 20? (1865).

Genus 102. Terias, Swainson.

317. **Terias euterpe.**

Colias euterpe, Ménétries, Bull. Mosc. p. 299. n. 13 (1832); Nouv. Mém. Mosc. iii. p. 121, pl. 11. fig. 4 (1834).

318. **Terias westwoodii.**

Terias westwoodii, Boisduval, Sp. Gén. Lép. i. p. 666. n. 22 (1836).

Eurema dina, Hübner, Zutr. ex. Schm. figs. 951, 952 (1837).

319. **Terias persistens.**

Terias persistens, Butler & Druce, Cist. Ent. v. p. 110 (July 1872).

320. **Terias calceolaria.**

Terias calceolaria, Butler & Druce, Cist. Ent. v. p. 110 (July 1872).

321. **Terias palmyra.**

Terias palmyra, Poey, Mem. Cuba, pl. 24. figs. 4–6 (1851).

322. **Terias eugenia**, ? ♀.

Terias eugenia, Wallengren, Wien. ent. Mon. iv. p. 33. n. 2 (1860).

323. **Terias sinoë.**

Pieris sinoë, Godart, Enc. Méth. ix. p. 138. n. 66 (1819).

324. **Terias albula**, var. **marginella.**

Terias marginella, Felder, Wien. ent. Mon. v. p. 97. n. 53 (1861).

325. **Terias stygmula.**

Terias stygmula, Boisduval, Sp. Gén. Lép. i. p. 661. n. 15 (1836); Lucas, in Ramon de la Sagra's Hist. Cuba, vii. p. 505, pl. 16. figs. 1 & 1*a* (1856).

Genus 103. Pyrisitia, Butler.

326. **Pyrisitia proterpia.**

Papilio proterpia, Fabricius, Syst. Ent. p. 478. n. 152 (1775); Lucas, Lép. Exot. pl. 38. fig. 1 (1835) [*Terias proterpia*].

327. **Pyrisitia gundlachia.**

Terias gundlachia, Poey, Mem. Cuba, p. 246, pl. 24. figs. 1–3 (1851).

Genus 104. LEPTOPHOBIA, Butler.

328. LEPTOPHOBIA ELODIA.

Pieris elodia, Boisduval, Sp. Gén. Lép. i. p. 529. n. 134 (1836); Lucas, Ramon de la Sagra's Hist. Cuba, vii. pl. 15. figs. 3, 3*a* (1857).

329. LEPTOPHOBIA TENUICORNIS.

Leptophobia tenuicornis, Butler & Druce, Cist. Ent. v. p. 110 (July 1872); Lep. Exot. pl. xliii. fig. 4 (1872).

Genus 105. AMYNTHIA[*], Swainson.

330. AMYNTHIA CLORINDE.

Colias clorinde, Godart, Enc. Méth. ix., Suppl. p. 813 (1823); Boisduval, Sp. Gén. Lép. i. pl. 19. fig. 4 (1836) [*Rhodocera clorinde*].

331. AMYNTHIA MÆRULA.

Papilio mærula, Fabricius, Syst. Ent. p. 479. n. 157 (1775); Donovan, Ins. Ind. pl. 27. fig. 1 (1800).

Genus 106. MEGANOSTOMA, Reakirt.

332. MEGANOSTOMA CESONIA.

Papilio cesonia, Stoll, Suppl. Cr. pl. 41. figs. 2, 2*b* (1790).

333. MEGANOSTOMA HELENA.

Meganostoma helena, Reakirt, Proc. Ent. Soc. Philad. ii. p. 358. n. 2 (1863).

Genus 107. CALLIDRYAS, Boisduval.

334. CALLIDRYAS SENNÆ.

Papilio sennæ, Linnæus, Syst. Nat. 1, ii. p. 764. n. 103 (1767); Butler, Lep. Exot. viii. pl. 23. figs. 1–4 (April 1871).

335. CALLIDRYAS PHILEA.

Papilio philea, Linnæus, Syst. Nat. ii. p. 764. n. 104 (1766); Butler, Lep. Exot. ii. pl. 35. figs. 1–4 (1872).

A good series of *P. melanippe*, Cr. (both sexes), came with the typical form in Van Patten's collection.

Genus 108. APHRISSA, Butler.

336. APHRISSA STATIRA.

♀. *Papilio statira*, Cramer, Pap. Exot. ii. pl. 120. figs. C, D (1779).

♂. *Papilio alcmeone*, Cramer, Pap. Exot. ii. pl. 143. fig. E (1779).

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[*] I find that the genus *Rhodocera* of Boisduval possesses characters which will fully justify its separation from this group.

Genus 109. Phœbis, Hübner.

Subgenus Phœbis, Butler.

337. **Phœbis cipris.**

♀. *Papilio cipris*, Cramer, Pap. Exot. ii. pl. 99. figs. E, F (1779).
♂. *Papilio hersilia*, Cramer, *l. c.* pl. 173. figs. C, D (1779).

Dr. van Patten brought a long series of this species in both sexes, the white female being most common.

338. **Phœbis trite.**

Papilio trite, Linnæus, Mus. Lud. Ulr. p. 248 (1764); Cramer, Pap. Exot. ii. pl. 141. figs. C, D (1779).

The white female appears to be more common than the yellow.

Subgenus Metura, Butler.

339. **Phœbis intermedia.**

♂ ♀. *Callidryas intermedia*, Butler, Cist. Ent. iv. p. 81 (Jan. 1872); Lep. Exot. pl. lv. figs. 5–8 (1874).

340. **Phœbis virgo.**

♂ ♀. *Callidryas virgo*, Butler, Trans. Ent. Soc. p. 9. n. 1 (1870); Lep. Exot. x. pl. 29. figs. 1–4 (1871).

This species was common in the collection.

341. **Phœbis rurina.**

Callidryas rurina, Felder, Wien. ent. Mon. v. p. 82. n. 36 (1861); Reise der Nov. Lep. ii. p. 194. n. 193, pl. 26. figs. 9–11 ("1865").

Only one female of this species came amongst several hundreds of the males in Van Patten's collection; Mr. Buckley also took hardly any in Ecuador, although the males were exceedingly abundant.

Genus 110. Pieris, Boisduval.

342. **Pieris josephina.**

Pieris josephina, Godart, Enc. Méth. ix. p. 158. n. 136 (1819); Hübner, Samml. ex. Schmett. (1819–1836) [*Cat. josephine*].

343. **Pieris notistriga.**

Pieris notistriga, Butler & Druce, Cist. Ent. v. p. 111 (July 1872).

344. **Pieris noctipennis.**

Pieris noctipennis, Butler & Druce, Cist. Ent. v. p. 111 (July 1872); Lep. Exot. pl. xliii. fig. 7 (1872).

Genus 111. Appias, Hübner.

345. **Appias poeyi.**

♂ ♀. *Appias poeyi*, Butler, P. Z. S. p. 49. n. 54 (1872).
♀. *Pieris ilaire*, Poey (*nec* Godart), Cent. Lep. (1833).

Genus 112. SYNCHLOË, Hübner.

346. **SYNCHLOË MONUSTE.**

Papilio monuste, Linnæus, Mus. Lud. Ulr. p. 237 (1764); Cramer, Pap. Exot. ii. pl. 141. fig. F (1779) [*P. monusta*].

Genus 113. DISMORPHIA, Hübner.

347. **DISMORPHIA SORORNA.**

♂ ♀. *Dismorphia sororna*, Butler, Cist. Ent. iv. p. 82 (1872); Lep. Exot. pl. xlvi. figs. 1, 2 (1873).

348. **DISMORPHIA CORDILLERA.**

♂. *Leptalis cordillera*, Felder, Wien. ent. Mon. vi. p. 409. n. 108 (1862); Reise der Nov. Lep. ii. p. 145. n. 111, pl. 22. fig. 11 ("1865"); ♀ Butler, Cist. Ent. iv. p. 81 (1872).

349. **DISMORPHIA DEIONE.**

Leptalis deione, Hewitson, Ent. Mo. Mag. vi. p. 68 (1869); Ex. Butt. iv. *Lep*. pl. 6. figs. 37, 38 (1870).

350. **DISMORPHIA AMPHIONE.**

Papilio amphione, Cramer, Pap. Exot. iii. pl. 232. figs. E, F (1782).

351. **DISMORPHIA HAGARESA.**

Dismorphia hagaresa, Butler, Cist. Ent. iv. p. 82 (Jan. 1872); Lep. Exot. pl. xlvi. fig. 3 (1873).

352. **DISMORPHIA LUBINA.**

Dismorphia lubina, Butler, Cist. Ent. iv. p. 83 (Jan. 1872); Lep. Exot. pl. xlvi. figs. 6, 7 (1873).

353. **DISMORPHIA VIRGO.**

Leptalis virgo, Bates, Ent. Mo. Mag. i. p. 5. n. 9 (1864).

354. **DISMORPHIA LUNINA.**

Dismorphia lunina, Butler & Druce, Cist. Ent. v. p. 111 (July 1872); Lep. Exot. pl. xlvi. figs. 8, 9 (1873).

355. **DISMORPHIA NEMESIS.**

Pieris nemesis, Latreille, Humb. Bonpl. Obs. Zool. ii. p. 78, pl. 35. figs. 7, 8 (1811-1819).

356. **DISMORPHIA VIRIDIFASCIA.**

Dismorphia viridifascia, Butler, Cist. Ent. iv. p. 83 (Jan. 1872); Lep. Exot. pl. xlvii. figs. 4, 5 (1873).

Interesting on account of the unusual colouring of the male and the dissimilarity of the female.

357. DISMORPHIA CITRINELLA.

Leptalis citrinella, Felder, Wien. ent. Mon. v. p. 77. n. 18 (1861).

358. DISMORPHIA OTHOË.

Leptalis othoë, Hewitson, Trans. Ent. Soc. ser. 3, vol. v. p. 562. n. 3 (1867); Ex. Butt. iv. *Lep.* pl. 5. figs. 26–28 (1870).

359. DISMORPHIA PALLIDULA, n. sp.

♂ ♀. Wings above black-brown, more or less greyish towards base of primaries and inner margin of secondaries; primaries with a broad oblique subovate postmedian costal spot, two small discal spots placed obliquely on each side of the lower radial, and a streak on centre of inner margin, creamy white; secondaries with a broad central patch, oval in male, subquadrate in female, creamy white; costal area of male with a large oval red-brown patch: wings below pale green; the white spots of upper surface indicated by a paler tint, and margined with squamose brown streaks; in the female the white band of primaries (which is larger than in the male) is clearly defined; the discal area and upper half of cell are also black-brown, and the base is greyish; body above greyish brown; pectus, palpi, and legs below clothed with white hairs; abdomen with pale yellow ventral streak. Expanse, ♂ 1 inch 9 lines, ♀ 1 inch 10 lines.

A pretty little species, allied to *D. othoë* of Hewitson.

360. DISMORPHIA FORTUNATA.

Leptalis fortunata, Lucas, Ann. Soc. Ent. France, p. 55, pl. 3. fig. 1 (1854).

Subfamily PAPILIONINÆ, Bates.

Genus 114. PAPILIO, Linnæus.

361. PAPILIO IPHIDAMAS.

Papilio iphidamas, Fabricius, Ent. Syst. 3, i. p. 17. n. 52 (1793).

Differs from typical form in having only three red spots on upper surface of hind wings and two white spots on under surface of front wings.

362. PAPILIO LYCIMENES.

Papilio lycimenes, Boisduval, Lép. Guat. p. 7 (1870).

Papilio iphidamas, Gray (*nec* Fabr.), Cat. Lep. Ins. B. M. i. p. 44. n. 225, pl. 8. figs. 1, 2 (1852).

363. PAPILIO ERITHALION.

Papilio erithalion, Boisduval, Sp. Gén. Lép. i. p. 295. n. 125 (1836); Felder, Reise der Nov. Lep. i. p. 25. n. 15, pl. 16. fig. *d* (1865).

364. PAPILIO PHOTINUS.

Papilio photinus, Doubleday, Ann. & Mag. Nat. Hist. xiv. p. 415 (1844); Gray, Cat. Lep. Ins. B. M. i. p. 65. n. 287, pl. 11. fig. 2 (1852).

365. PAPILIO MYLOTES.

Papilio mylotes, Bates, Trans. Ent. Soc. ser. 3, vol. v. p. 346, note (1861).

366. PAPILIO PHILENOR.

Papilio philenor, Linnæus, Mant. Plant. p. 535 (1771); Smith & Abbot, Lep. Georg. i. pl. 3 (1797).

367. PAPILIO POLYDAMAS.

Papilio polydamas, Linnæus, Mus. Lud. Ulr. p. 192 (1764); Drury, Ill. Ex. Ent. i. pl. 17. figs. 1, 2 (1773).

368. PAPILIO CLUSOCULIS.

Papilio clusoculis, Butler, Cist. Ent. iv. p. 85 (Jan. 1872); Lep. Exot. pl. lviii. fig. 2 (1874).

369. PAPILIO BRANCHUS.

♀. *Papilio branchus*, Doubleday, Ann. & Mag. Nat. Hist. xviii. p. 373 (1846); Gray, Cat. Lep. Ins. Brit. Mus. i. p. 62. n. 277, pl. 7. fig. 3 (1852).

Slightly larger than the type; this species is almost exactly alike in both sexes. It is represented in the collection of the British Museum from Guatemala, Polochic valley, &c.

370. PAPILIO RHODOSTICTUS, n. sp.

Wings above sepia-brown, fringes varied with creamy whitish, an oblique bifid elongate cream-coloured spot crossing median nervure at end of cell in primaries; a large quinquefid rosy patch just beyond cell of secondaries, the two outer spots of the patch being very small, also a spot of the same colour at anal angle; body sepia-brown; head yellow-spotted; neck red-spotted: wings below altogether lighter in tint, primaries becoming paler towards apex; a trifid creamy transverse oblique patch, cut by the median nervure and second median branch; secondaries with an oblique postmedian series of four rosy spots placed between the median branches and the radials immediately beyond cell; a discal waved or subangulated series of seven rosy spots, the first three parallel to margin, and small, the fourth larger, the fifth and sixth large, irrorated with whitish internally, and touching the postmedian series, the seventh large, but divided by a central black bar into two small spots, the apical spot irrorated with white; fringe at anal angle reddish; body brown, thorax spotted with orange. Expanse 3 inches 5 lines.

Belongs to the *P. anchisiades* group.

371. PAPILIO SERVILLEI.

Papilio servillei, Godart, Enc. Méth. ix. Suppl. p. 809 (1823).

Papilio columbus, Kollar, Denkschr. Akad. Wiss. Wien, math.-nat. Cl. i. p. 351. n. 1, pl. 42. figs. 1, 2 (1850).

372. **Papilio orabilis.**

Papilio orabilis, Butler, Cist. Ent. iv. p. 84 (Jan. 1872); Lep. Exot. pl. lviii. fig. 1 (1874).

This was the finest of the *Papiliones* collected by Dr. van Patten.

373. **Papilio calliste.**

Papilio calliste, Bates, Ent. Mo. Mag. i. p. 3. n. 5 (1864).
Papilio l'Orzæ, Boisduval, Insect. Agric. p. 103 (1869).

374. **Papilio marchandii.**

Papilio marchandii, Boisduval, Sp. Gén. Lép. i. p. 350. n. 192 (1836).

375. **Papilio penthesilaus.**

Papilio penthesilaus, Felder, Reise Nov. Lep. i. p. 52. n. 40, pl. 11. fig. C (1865).

376. **Papilio epidaus.**

Papilio epidaüs, Doubleday & Hewitson, Gen. Diurn. Lepid. pl. 3. fig. 1 (1846).

377. **Papilio thoas.**

Papilio thoas, Linnæus, Mant. Plant. p. 536 (1771); Drury, Ill. Ex. Ent. i. pl. 22. figs. 1, 2 (1773).

378. **Papilio erostratus.**

Papilio erostratus, Westwood, Trans. Ent. Soc. v. p. 36, pl. 3. figs. 2, 2* (1847).

379. **Papilio lycophron.**

Heraclides lycophron, Hübner, Samml. ex. Schmett. (1816–1836).

380. **Papilio polycaon.**

Papilio polycaon, Cramer, Pap. Exot. iii. pl. 203. figs. A, B (1782).

Differs from the typical form in the broader central band, the spots of which touch the costa of front wings, and in having no spot on the tail.

381. **Papilio pandion.**

Papilio pandion, Felder, Reise der Nov. Lep. i. p. 79. n. 61 (1865).

382. **Papilio idæus.**

Papilio idæus, Fabricius, Ent. Syst. 3, i. p. 16. n. 48 (1793); Donovan, Ins. Ind. pl. 18. fig. 2 (1800).

383. **Papilio sadalus.**

Papilio sadalus, Lucas, Rev. Zool. p. 133, pl. 10. fig. 4 (1852).

Genus 115. PYRRHOSTICTA*, Butler.

384. **PYRRHOSTICTA LÆTITIA.**

Papilio lætitia, Butler, Cist. Ent. iv. p. 84 (Jan. 1872).
Pyrrhosticta lætitia, Butler, Lep. Exot. pl. lvii. fig. 4 (1874).

385. **PYRRHOSTICTA VULNERATA.**

Papilio vulneratus, Butler, Cist. Ent. iv. p. 85 (Jan. 1872).
Pyrrhosticta vulnerata, Butler, Lep. Exot. pl. lviii. fig. 3 (1874).

Family HESPERIDÆ, Leach.

Genus 116. GONIURUS, Hübner.

386. **GONIURUS PROTEUS.**

Papilio proteus, Linnæus, Mus. Lud. Ulr. p. 333 (1764); Clerck's Icones, pl. 42. fig. 1 (1764).

387. **GONIURUS SIMPLICIUS.**

Papilio simplicius, Stoll, Suppl. Cram. pl. 39. figs. 6, 6 E (1790).

388. **GONIURUS ALCÆUS?**

Eudamus alcæus, Hewitson, Descr. Hesp. p. 3. n. 1 (1867).

389. **GONIURUS ZILPA.**

Goniurus zilpa, Butler, Lep. Exot. p. 109, pl. 40. fig. 2 (1872).

390. **GONIURUS ALBOFASCIATUS.**

Eudamus albofasciatus, Hewitson, Descr. Hesp. p. 3. n. 2 (1867).

391. **GONIURUS EXADEUS.**

Papilio exadeus, Cramer, Pap. Exot. iii. pl. 260. fig. C (1782).

Genus 117. EUDAMUS, Swainson.

392. **EUDAMUS VECTILUCIS.**

Eudamus vectilucis, Butler, Lep. Exot. p. 109, pl. 40. fig. 6 (1872).

Genus 118. TELEGONUS, Hübner.

393. **TELEGONUS FULGURATOR.**

Papilio fulgurator, Walch, Naturf. vii. p. 115, pl. 1. figs. 2 *a*, *b* (1775).

♂. *Hesperia mercatus*, Fabricius, Ent. Syst. 3, i. p. 332. n. 260 (1793).

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* This genus can at once be detected by the serrated costa of the primaries in both sexes; none of the species has a well-defined tail to the secondaries. There are, no doubt, plenty of characters by which *Papilio* may be subdivided: Mr. Scudder has commenced with the N. American species; and it is to be hoped that others will soon follow his example, and thus reduce this unwieldy genus to something like a manageable compass.

394. **TELEGONUS IMALENA.**

Telegonus imalena, Butler, Lep. Exot. p. 109, pl. 40. fig. 1 (1872).

395. **TELEGONUS ALARDUS.**

Papilio alardus, Stoll, Suppl. Cram. pl. 39. figs. 7, 7 E (1790).

396. **TELEGONUS CRETEUS.**

Papilio creteus, Cramer, Pap. Exot. iii. pl. 284. figs. C, D (1782).
Papilio parmenides, Cramer, Pap. Exot. iv. pl. 364. figs. E, F (1782).

397. **TELEGONUS ANAPHUS.**

Papilio anaphus, Cramer, Pap. Exot. ii. pl. 178. fig. F (1779).

Genus 119. ÆTHILLA, Hewitson.

398. **ÆTHILLA LAVOCHREA.**

Æthilla lavochrea, Butler, Lep. Exot. p. 110, pl. 40. fig. 4 (1872).

In the British Museum from Mexico.

Genus 120. ARTEUROTIA, Butler & Druce.

399. **ARTEUROTIA TRACTIPENNIS.**

Arteurotia tractipennis, Butler & Druce, Cist. Ent. v. p. 112 (July 1872); Lep. Exot. pl. lxiv. fig. 5 (1874).

Genus 121. SPATHILEPIA, Butler.

400. **SPATHILEPIA CLONIUS.**

Papilio clonius, Cramer, Pap. Exot. i. pl. 80. figs. C, D (1779).

401. **SPATHILEPIA TERRANEA.**

Spathilepia terranea, Butler, Lep. Exot. p. 111, pl. 40. fig. 8 (1872).

In the British Museum from the Lower Amazons.

Genus 122. AUGIADES, Hübner.

Section *Phanus*, Hübn.

402. **AUGIADES VITREUS.**

Papilio vitreus, Cramer, Pap. Exot. iv. pl. 365. fig. D (1782).

This appears to be a very common, widely spread, and variable species.

Genus 123. PYRRHOPYGA, Hübner.

403. **PYRRHOPYGA THASUS.**

Papilio thasus, Cramer, Pap. Exot. iv. pl. 380. figs. M, N (1782).

Genus 124. ERYCIDES, Hübner.

404. **ERYCIDES VIDA.**

Erycides vida, Butler, Cist. Ent. iv. p. 86 (Jan. 1872); Lep. Exot. pl. lxiv. fig. 4 (1874).

405. **ERYCIDES SOCIUS.**

Erycides socius, Butler & Druce, Cist. Ent. v. p. 112 (July 1872).

Genus 125. CARYSTUS*, Hübner.

406. **CARYSTUS MINOS.**

Hesperia minos, Latreille, Enc. Méth. ix. p. 756. n. 78 (1823).

407. **CARYSTUS CORIDON.**

Papilio coridon, Fabricius, Syst. Ent. p. 533. n. 385 (1775); Butler, Fabr. Cat. pl. 3. fig. 6 (1870).

408. **CARYSTUS DECEPTUS.**

Carystus deceptus, Butler & Druce, Cist. Ent. v. p. 112 (July 1872).

409. **CARYSTUS EPICINCEA.**

Carystus epicincea, Butler & Druce, Cist. Ent. v. p. 113 (July 1872).

410. **CARYSTUS GEMMATUS.**

Carystus gemmatus, Butler, Cist. Ent. iv. p. 86 (Jan. 1872); Lep. Exot. pl. lxiv. fig. 2 (1874).

A most beautiful and apparently rare species.

Genus 126. PROTEIDES, Hübner.

411. **PROTEIDES IDAS.**

Papilio idas, Cramer, Pap. Exot. iii. pl. 260. figs. A, B (1782).

412. **PROTEIDES EVADNES.**

Papilio evadnes, Cramer, Pap. Exot. iv. pl. 343. figs. G, H (1782).

Genus 127. PHLEBODES, Hübner.

413. **PHLEBODES JUSTINOIDES.**

Phlebodes justinoides, Butler & Druce, Cist. Ent. v. p. 113 (July 1872).

Genus 128. PAMPHILA, Fabricius.

414. **PAMPHILA HALA.**

Pamphila hala, Butler, Trans. Ent. Soc. p. 504 (1870).

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* This name has been recently adopted by Dr. Stål for a genus of Homopterous insects.

415. PAMPHILA ZABULON.

Hesperia zabulon, Boisduval & Leconte, Lép. Am. Sept. pl. 76. figs. 6, 7 (1833).

Hesperia hobomok, Harris, Ins. Mass. p. 313, fig. 137 (1862).

Hesperia pocahontas, Scudder, Proc. Ess. Inst. iii. p. 171. n. 67 (1862).

Var. melan. *Hesperia quadraquina*, Scudder, Proc. Bost. Nat. Hist. Soc. xi. p. 381. n. 76 (1861).

416. PAMPHILA ARES.

Hesperia ares, Felder, Verh. zool.-bot. Ges. Wien, xii. p. 477. n. 65 (1862).

417. PAMPHILA ATHENION.

Talides athenion, Hübner, Samml. ex. Schm. (1816–41).

418. PAMPHILA VIBEX.

Thymele vibex, Hübner, Zutr. ex. Schm. figs. 685, 686 (1832).

419. PAMPHILA UNIFORMIS.

Pamphila uniformis, Butler & Druce, Cist. Ent. v. p. 113 (July 1872).

420. PAMPHILA INIMICA.

Pamphila inimica, Butler & Druce, Cist. Ent. v. p. 114 (July 1872).

Genus 129. PYRGUS, Hübner.

421. PYRGUS SYRICHTUS.

Papilio syrichtus, Fabricius, Syst. Ent. p. 534. n. 394 (1775).

Papilio orcus, Cramer, Pap. Exot. iv. pl. 334. figs. I–L (1782).

Pyrgus montivagus, Reakirt, Proc. Acad. Nat. Sci. Philad. p. 334. n. 33 (1866).

Genus 130. PYTHONIDES, Hübner.

422. PYTHONIDES TRYXUS.

Papilio tryxus, Cramer, Pap. Exot. iv. pl. 334. figs. G, H (1782).

423. PYTHONIDES SALLÉI.

Leucochitonea salléi, Felder, Reise der Nov. Lep. iii. p. 525. n. 723, pl. 74. fig. 25 (1867).

Genus 131. THANAOS, Boisduval.

424. THANAOS FUNERALIS.

Nisoniades funeralis, Scudder & Burgess, Ass. Hex. Ins. in Proc. Bost. Nat. Hist. Soc. xiii. p. 293 (1870).

Very similar to *T. tristis*, Boisd.

425. THANAOS INVISUS.

Thanaos invisus, Butler & Druce, Cist. Ent. v. p. 114 (July 1872).

Genus 132. PLESIONEURA, Felder.

426. PLESIONEURA ELIGIUS.

Papilio eligius, Cramer, Pap. Exot. iv. pl. 354. fig. H (1782).

Genus 133. ACHLYODES, Hübner.

427. ACHLYODES OBSCURUS.

Anastrus obscurus, Hübner, Samml. ex. Schm. (1816–41).

428. ACHLYODES OZOTES.

Achlyodes ozotes, Butler, Trans. Ent. Soc. p. 515 (1870).

429. ACHLYODES OZEMA.

Achlyodes ozema, Butler, Trans. Ent. Soc. p. 515 (1870).

430. ACHLYODES SEMPITERNUS.

Achlyodes sempiternus, Butler & Druce, Cist. Ent. v. p. 114 (July 1872).

431. ACHLYODES VIRIDICEPS.

Achlyodes viridiceps, Butler & Druce, Cist. Ent. v. p. 115 (July 1872).

Genus 134. HELIAS, Fabricius.

432. HELIAS PHALÆNOIDES.

Urbanus vetus phalænoides, Hübner, Samml. ex. Schmett. (1806–16).

433. HELIAS LACTIFERA.

Helias lactifera, Butler & Druce, Cist. Ent. v. p. 115 (July 1872).

Genus 135. ANTIGONUS. Hübner.

434. ANTIGONUS NEARCHUS.

Hesperia nearchus, Latreille, Humb. Bonpl. Obs. Zool. ii. p. 135, pl. 43. figs. 3, 4 (1811–23).

Since the above was written, Mr. Druce has received from Costa Rica and described three new species—*Papilio sadyattes*, *Eresia cœla*, and *Mesosemia ceropia* (see Ent. Mo. Mag. 1874, pp. 36, 37).

4. On some new Species of *Drassides*.

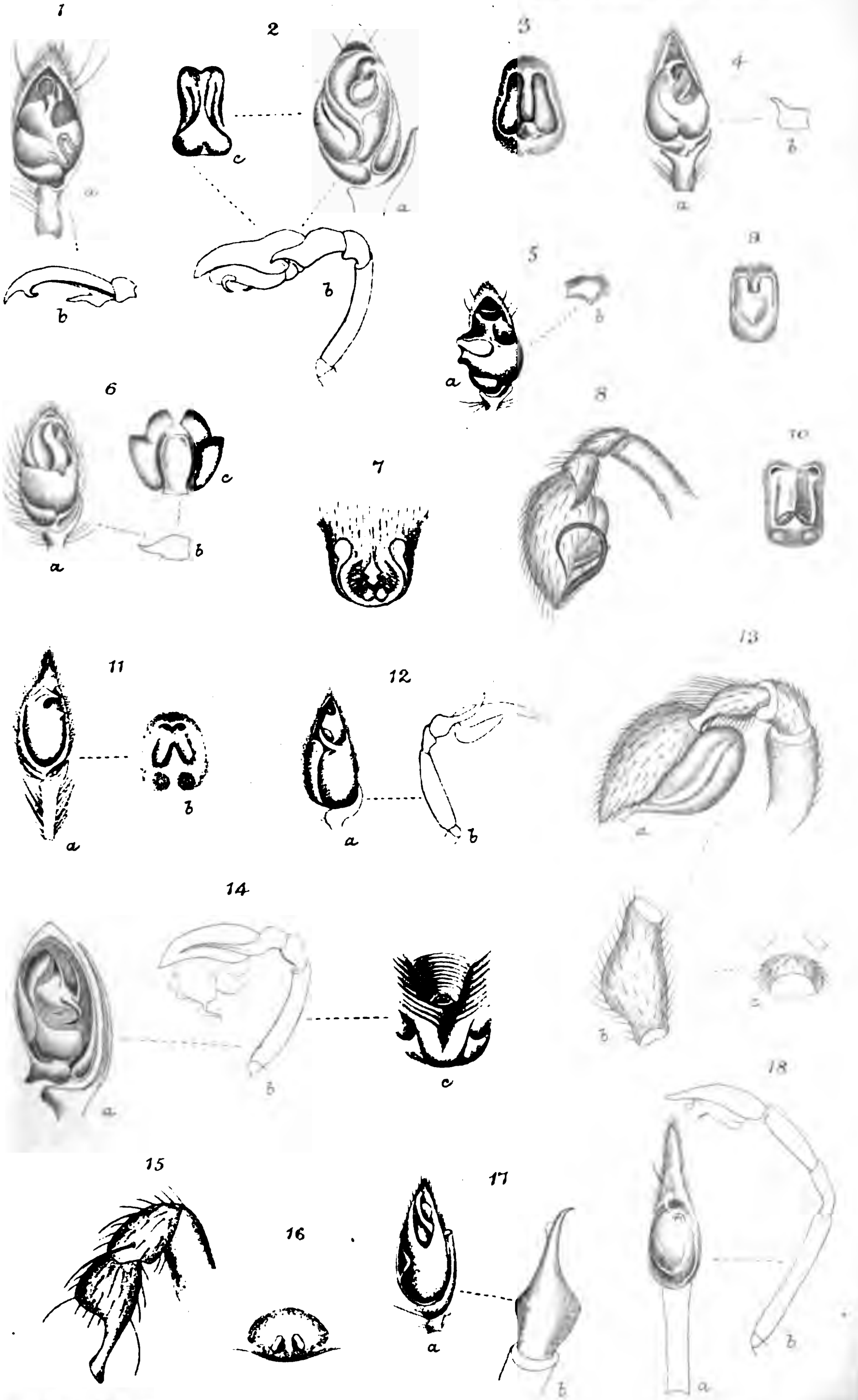
By the Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S., &c.

[Received May 6, 1874.]

(Plates LI. & LII.)

Of the species (forty in number) described in the present paper from types in my own collection, thirty-nine are believed to have been hitherto unknown to science. *Nineteen* are from Egypt, *eleven* from Bombay (one of these, also in great abundance, from

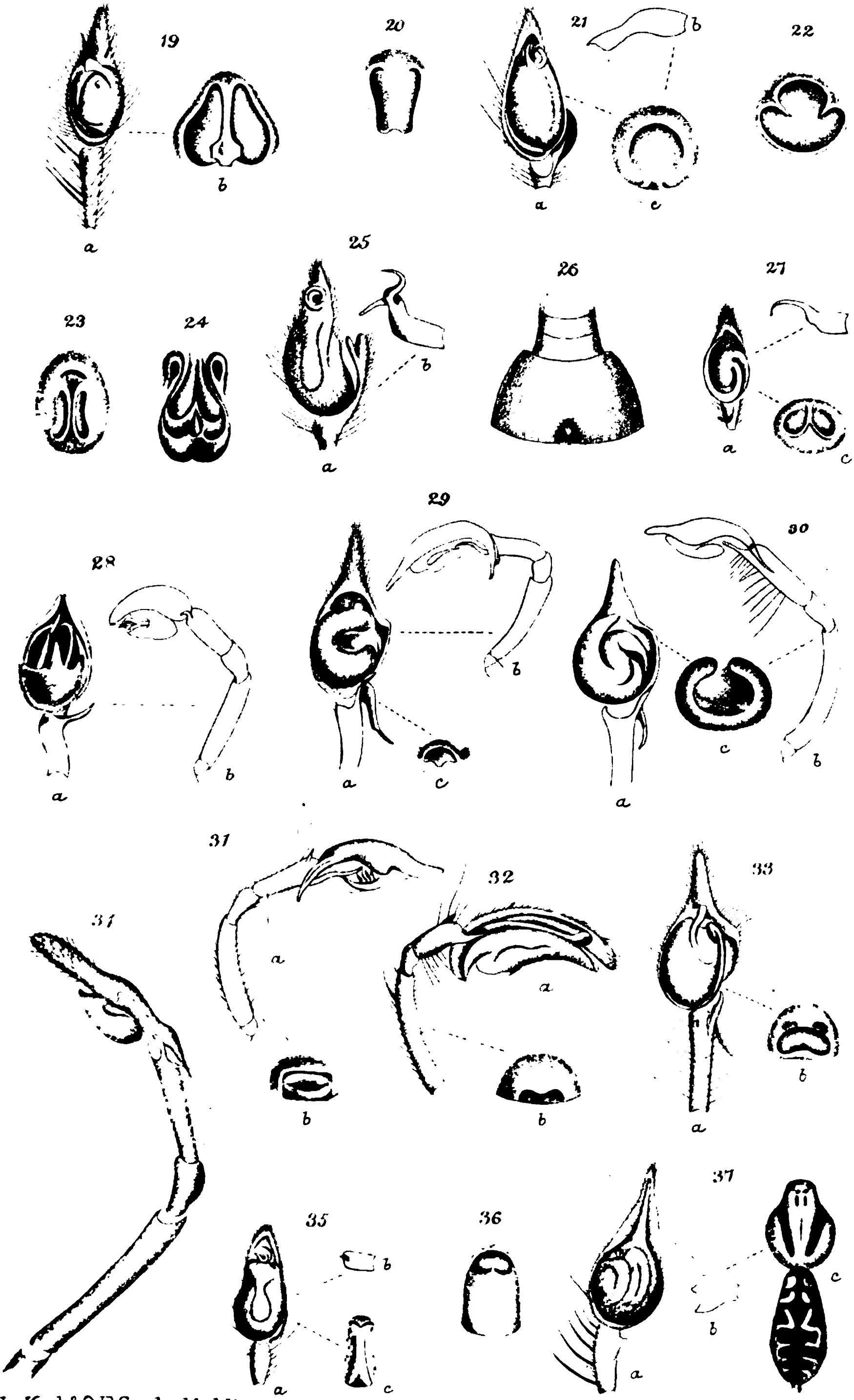
P. Z. S. 1874. Pl. LI.



L. Koch & O. P. Cambridge delt.
A. T. Hollick lith.

W. West & C

New Species of Drassides



L. Koch & O.P. Cambridge del.
A.T. Hollick lith.

W West & Co imp.

New Species of Drassides.

Ceylon), *eight* are European, *one* South-American, and *one* North-American. The larger number were intended to have been included in Dr. L. Koch's work on the Drassides ('Die Arachniden-Familie der Drassiden,' Nürnberg, 1866); but that work having long since been discontinued before its completion, I have thought it best not to delay their publication any longer. My thanks are especially due to Dr. Koch for the kind readiness with which he has placed at my disposal all the dissectional drawings made from the type specimens for his own work; these, supplemented with a few others drawn by myself, form the materials of the Plates intended to illustrate this paper. It will be observed that almost all the drawings are taken from portions of the genital organs—the palpi in the males, the genital aperture in the females. The form and structure of these parts afford the best, and in some instances the sole reliable, criteria for the determination of the species. The constant value of the palpi and palpal organs of male spiders for this purpose was first pointed out by our veteran araneologist Mr. John Blackwall; and it has since been abundantly recognized by all araneologists of any note, though, as far as I am aware, the credit of its discovery has not been sufficiently awarded by continental writers to its discoverer. The form of the genital aperture in female spiders as a specific character was first, I believe, made use of by Dr. L. Koch in the work on the Drassides above mentioned; and it seems likely to prove a most valuable differential character with respect to the females of other groups as well as that of the Drassides. In regard to them especially, it is not too much to say that, but for this character, many species would be quite indeterminable, from their great similarity in general form and colour to others nearly allied. And the same remark applies to the males also, many of which are with great difficulty recognizable as distinct species, except by the form and structure of the palpi and palpal organs. The Drassides are a very plainly coloured sombre-looking group; but few present any marked pattern or colouring; and in the absence of these a well-defined and easily observed structural character is peculiarly valuable. It is perhaps hardly necessary to say here that these sexual and, as observed before, so strongly specific characters are not developed either in the male or female spiders until the last moult or change of skin, when they become adult.

Family Drassides.

Genus Gnaphosa, Latr.

Gnaphosa harpax, sp. n. (Plate LI. fig. 1.)

Adult male, length 2¾ lines.

This Spider is of ordinary form. The *cephalothorax* is broad oval, most pointed before, and somewhat depressed; the profile slopes gradually in a curved line from the thoracic junction to the eyes, and the lateral constriction forwards is but slight; its colour is yellow-brown with blackish margins; the normal grooves and indentations are well marked, and suffused with black-brown and dark dusky yellow-brown. The sides of the cephalothorax are furnished with pale dull yellowish adpressed hairs.

The *eyes* are in the usual position, two rather widely separated divergently curved lines of four eyes each; the central eyes of the hinder row are smaller than the laterals, oval, and oblique; and the space between them is greater than that between each and the lateral of the same row on its side, these last two being almost contiguous to each other. The height of the clypeus is less than half that of the facial space. The eyes of each lateral pair are widely separated from each other; and the intervals between the eyes of the front row are the same apparently as that between those of the hinder one.

The *legs* are rather long and strong; their relative length is 4, 1, 2, 3; they are of a brownish-yellow colour, furnished sparingly with hairs and a few, mostly slender, spines.

The *palpi* are short, strong, and similar in colour to the legs: the radial and cubital joints are both short and of about equal length; but the former is the stronger, and has its outer extremity produced into a strong apophysis, whose length is about a third of that of the digital joint and longer than the radial joint itself; the extremity of this apophysis is flattened, curved, and pointed; and a little way from the extremity is a corneous-looking, sharp-pointed, hooked prominence directed outwards and backwards: the digital joint is strong, equalling in length the humeral one, and exceeding the radial and cubital together; it is oval, drawn out at its fore extremity. The palpal organs are well developed and rather prominent, but not very complex, with a slender curved filiform spine issuing from their fore extremity.

The *falces* are moderate in length and strength, vertical, conical, and of a deep red chestnut-brown colour.

The *maxillæ* and *labium* are of normal form, and of a dark yellow-brown colour, the extremities of the former being whitish.

The *abdomen* is of an oblong-oval form, thinly furnished with hairs; the upper part and sides are of a sooty brown colour, marked with numerous pale whitish drab spots and blotches somewhat symmetrically arranged; some of them form some transverse broken angular bars or chevrons on the hinder half of the upperside, the dark intervals forming transverse curved bars, at the extremities of which on either side is an circular depressed spot of a darker hue. On the fore half of the upperside is an elongate central band of a deep sooty brown, on either side of the posterior part of which are three more conspicuous depressed spots in a parallel line. The underside of the abdomen is of a pale dusky drab-yellow hue, with the plates of the spiracles large and of a yellow-brown colour; two irregular blackish lines run from this point, a little converging towards the spinners, which, however, they do not nearly reach.

The inferior pair of spinners are long, strong, and of a yellow-brown colour; those of the superior pair are paler and not half the length of the inferior.

A single adult male of this distinct species, which is allied to both

G. plumalis (Cambr.) and *G. exornata* (Koch), was received in a fine collection of spiders kindly made for me in the Bombay Presidency by Major Julian Hobson, H.M.S. Corps.

GNAPHOSA PROCERA, sp. n. (Plate LI. fig. 2.)

Adult male, length 4 lines (very nearly).

This Spider, in size, general form, structure, colours, and markings, is exceedingly like *G. cambridgii* (Cambr. & Koch), *G. lunata* (Cambr.), *G. kochii* (Cambr.), and *G. conspersa* (Cambr.) (see "Spid. of Palestine and Syria," P. Z. S. 1872, pp. 227–230), but may be at once distinguished by the form of the palpi; these are rather short and strong. The radial is of the same length as the cubital joint, and there is but little difference in their strength; the former has its outer extremity prolonged into a short, slightly bent, strongish, tapering, sharp-pointed, red-brown, corneous-looking apophysis, of about half the length of the joint itself, and contiguous to the base of the digital joint; these joints are furnished with hairs and strong bristles. The digital joint is large, and rather exceeds in length that of the radial and cubital together; its form is oval, gradually drawn out at its fore extremity. The palpal organs are well developed, and composed of various curved corneous spines and processes, not easy to be described differentially, but seen at a glance to be different on comparison with those of the other closely allied species; one conspicuous spine issues from the middle near the base of the palpal organs, and, curving over round their inner side, terminates in a sharp point near their outer extremity.

The *cephalothorax* is yellow, lightest towards the margins, which are bounded laterally by a black line; the sides have some blackish irregular markings; and two curved lines run backwards from the hind lateral eyes, converging to the thoracic junction.

The *legs*, *palpi*, *falces*, *maxillæ*, *labium*, and *sternum* are also yellow, the falces, however, being suffused with red-brown; and the digital joints of the palpi of a brownish hue.

The *abdomen* is of a clear straw-yellow colour, marked above with small black spots and points; those along the centre are mostly in parallel pairs, forming two irregular longitudinal rows; others are more thickly scattered along the margins, whence some run over upon the sides in curved oblique rows; and near the base of each of the superior and inferior spinners is a larger black spot or blotch, finishing on each side the two hinder oblique lateral rows; along the central line of the fore half is a rather tapering oblong yellow-brown marking. The underside is unspotted. The superior pair of spinners are small and short, less than one third the length of those of the inferior pair. The abdomen in the present species is more clearly and distinctly spotted, and less liable, apparently, to crowding, or to suffusion and running together than in the others.

The *female* is rather larger than the male, but resembles it exactly in colours and markings; the form of the genital aperture is exceedingly like that of the female of *G. cambridgii*; and should the two species ever be found in the same locality, it will require great care to discriminate them; there is, however, a perceptible difference to be seen on comparison.

Adult examples of each sex were found by myself near Alexandria, Egypt, under stones.

Dr. Koch has pointed out to me a good distinction between this species and *P. conspersa* (Cambr.) in the plumose character of the hairs on the sternum of the former, those on the sternum of the latter being of an ordinary kind.

GNAPHOSA MARGINATA, sp. n. (Plate LI. fig. 3.)

Adult female, length 3½ lines.

This species is of ordinary form and general structure.

The *cephalothorax* is yellow, with a fine marginal black line; on either side of the caput a curved blackish irregular line runs from the extremity of the hinder row of eyes, the two lines converging at the thoracic junction; the sides of the cephalothorax are clothed with pale yellowish-grey adpressed hairs and a dusky brownish, indistinct, irregular, longitudinal line.

The *eyes* are in the usual position; those of the hind central pair are pearl-white, oval, oblique, and each is nearer to the lateral of the same row on its side than the two are to each other; the height of the clypeus appeared to be as nearly as possible equal to half the height of the facial space.

The *legs* are tolerably strong and moderate in length, their relative length being 1, 4, 2, 3; they are similar in colour to the cephalothorax, and are furnished with hairs and spines; and each tarsus terminates with two curved pectinated claws, beneath which is a small scopula.

The *falces* are rather short, strong, and conical in form; they are of a red-brown colour, furnished with short bristly hairs in front; the fangs are short, and on the inner margin of each falx beneath the pointed extremity of the fang is a small patch of short spine-like erect bristles.

The *palpi* are short, stout, similar in colour to the legs, furnished with hairs and spines, and terminated with a slightly curved pectinated claw.

The *maxillæ*, *labium*, and *sternum* are normal in form, and similar in colour to the legs (the two latter parts being a little the darkest).

The *abdomen* is of a somewhat oblong-oval form, thinly clothed with hairs of a pale whitish-yellow colour, and irregularly margined on the upperside with black-brown; the six normal impressed spots on the fore half are in the usual position and blackish in colour, and a longitudinal central oblong marking of the same colour runs between them; following the last pair of these impressed spots, towards the spinners are four or five transverse angular bars or chevrons (with the vertices directed forwards) of a yellow-brown colour, the extremities of each ending in a blackish spot; the intervals between these chevrons are of a paler colour than the rest of the abdomen. The underside is immaculate; the spiracular plates are pale yellow;

and the genital aperture, which, like that of all the species of this genus and of most others also, is of peculiar and characteristic form (*vide* Plate LI. fig. 3) and of a dark blackish red-brown colour; the spinners are of moderate length, those of the inferior pair being strongest and slightly longest.

A single adult female was found by myself in Egypt, among the débris of an old wall, in 1864.

GNAPHOSA VENATRIX, sp. n. (Plate LI. fig. 4.)

Adult male, length 2¼ lines.

This species is very nearly allied both to *G. marginata*, *G. corcyracea*, and *G. plumalis*; it is, however, smaller, and differs notably in the form of the radial joint of the palpus, as well as in other less prominent particulars.

The *cephalothorax* is of a short oval form, pointed before and very flattened above, of a yellow colour, clothed with greyish adpressed hairs; it is margined with blackish, and, besides a curved blackish irregular line from inside each lateral eye of the hinder row to the thoracic junction, the sides have some blackish markings between the normal converging indentations.

The *eyes* are in the usual position; but those of the hinder row appeared to be very nearly equidistant from each other, each one of the hind central (oblique-oval) eyes being nearer to the lateral of the same row on its side than usual; each of the fore central pair seemed to be contiguous to the lateral of the same row on its side, and the two (fore centrals) form a line equal in length to that formed by the hind centrals.

The *legs* are strong, moderately long, of a pale yellow colour, furnished with hairs, bristles, and spines (the latter chiefly on those of the two hinder pairs); the tarsi end with two slightly curved pectinated claws; but there appeared to be no scopula beneath them; the relative length of the legs is 4, 1, 2, 3.

The *palpi* are short, strong, similar in colour to the legs, and furnished with hairs and bristles; the radial is about equal in length to the cubital joint, and has its outer extremity produced into a small, slightly curved, pointed apophysis; the digital joint is large, oval, pointed before, longer than the radial and cubital joints together; the palpal organs are well developed, rather prominent behind, and consist of several corneous processes and spines.

Falces not very large, a little projecting, conical in form, and of a palish yellow-brown colour.

Maxillæ, *labium*, and *sternum* normal in form, and of a pale yellow colour, furnished with hairs.

Abdomen of a short oblong-oval form, and of a dusky drab colour, marked above with short blackish lines, spots, and striæ, chiefly towards the sides; on the hinder half of the upperside is a longitudinal series of transverse angular bars or chevrons of a clear pale drab yellowish colour, divided from each other by blackish lines or broken chevrons; the underside has no markings. The spinners are greatly unequal in size, those of the inferior pair being more than double the length of and very much stronger than those of the superior pair.

A single adult male was found by myself at Alexandria (Egypt) in April 1864.

GNAPHOSA CORCYRÆA, sp. n. (Plate LI. fig. 5.)

Adult male, length 2½ lines.

This Spider is of ordinary form and general structure, and is allied nearly to *G. plumalis* (Cambr.), but may be easily distinguished by the form of the palpi and palpal organs.

The *cephalothorax* is yellow-brown, narrowly margined with black and with a broad marginal band of white pubescent hairs; the indentations marking the caput from the thorax are strongly suffused with blackish, as also, though not quite so strongly, are the other normal indentations; the upper part of the caput is furnished with white pubescent hairs; the height of the clypeus is less than half that of the facial space.

The *eyes* are small, not very unequal in size, and in the ordinary position; those of the hind central pair are further from each other than each is from the lateral of the same row on its side; the interval between each lateral and central on its side of this row is greater than the diameter of the lateral.

The *legs* are rather short, strong, furnished with spines and hairs; but these last were nearly all rubbed off in the only example found; the legs are of a yellow-brown colour, and their relative length is 4, 1, 2, 3.

The *palpi* are short and strong, and similar in colour to the legs; the radial is short, but equal in length and strength to the cubital, and its outer extremity is produced into a short, broad, obtuse apophysis, having several bluntish points at its extremity; the digital joint is rather large, and longer than the radial and cubital joints together; it is of an oval form, and has a small prominence near its base on the outer side. The palpal organs are well developed and prominent, but not very complex, consisting of a large corneous lobe a little irregular in its outline on the inner side and at the extremity.

Falces moderate in size, straight, nearly vertical, and of a conical form and dark yellow-brown colour.

The *maxillæ, labium,* and *sternum* are of ordinary form, and similar to the cephalothorax in colour.

The *abdomen* is of moderate size and oval form, rather truncate before, and not very convex above; it is of a blackish-brown colour above. Six impressed spots of a pale colour, arranged in two short, longitudinal, curved, divergent rows of three each on the fore half of the upperside, are clothed with whitish hairs; between these is a shortish dark blackish oblong bar or patch; and from this to the spinners runs a broadish central pale band, emitting on each side several short slightly oblique pale bars clothed with whitish hairs; the sides have three broad pale yellow-drab, oblique bands nearly contiguous to each other and running from the spinners forwards; the underside is pale yellow-drab. Spinners prominent and rather long, but not very unequal in length; those of the inferior pair are strongest; they are of a yellow-brown colour.

A single adult male was found under a stone at Corfu by myself in May 1864.

Genus PROSTHESIMA, L. Koch (*Melanophora*, C. Koch).

PROSTHESIMA TRISTICULA, sp. n. (Plate LI. fig. 6.)

Adult male, length rather more than 2½ lines.

In general character, form, and colour this Spider is of the ordinary type.

The *cephalothorax* is but very slightly constricted on the sides at the caput, and the upper surface is tolerably uniformly rounded on the sides; its colour, as well as that of the maxillæ, is yellow-brown, sparingly clothed with paler hairs, the normal indentations being shown by converging dusky brown rays meeting in a small longitudinal reddish brown line at the thoracic junctional indentation.

The *eyes* are in two slightly curved and as nearly as possible concentric transverse rows, the foremost row being the shortest; they form a transverse curved oblong figure, the curve directed backwards, and the length (taking the foremost row as its length) about double its width; the interval between the eyes of the hind central pair is a little greater than that between each of them and the hind lateral eye on its side, being slightly greater than the diameter of one of the former; the lateral eyes of each row are the largest, the fore laterals being rather larger than the hind laterals; each fore lateral is separated from the hind lateral nearest to it by an interval equal to the diameter of the former; the fore centrals are smallest of the eight, placed on a slight prominence, and wider apart from each other than each is from the fore lateral on its side, from which each is separated by no more than half the diameter of the fore central eye.

The height of the clypeus is rather less than half that of the facial space.

The *legs* are tolerably long and strong; their relative length is 4, 1, 2, 3; they are fairly furnished with hairs, some of them coarse and long, and bristles; and on those of the third and fourth pairs there are strong spines on the tibial and metatarsal joints. The colour of the legs is a dusky greenish yellow-brown; the tarsi generally brown, those of the fourth pair, however, being pale yellow; the inferior surface of the tarsi is pretty thickly clothed with short strong hairs, but scarcely amounting to a scopula; each tarsus ends with two strongish curved claws, pectinated or toothed beneath their posterior half. The claws on the tarsi of the fourth pair are stronger than those of the other legs.

The *palpi* are short, brownish yellow (except the digital joint, which is darker brown), and furnished sparingly with hairs. The cubital and radial joints are short; the latter is the shortest, and has its extremity on the outer side prolonged into a tapering blunt-pointed apophysis exceeding in length the joint itself. The digital joint is of ordinary form, rather large, and longer than the radial and cubital joints together. The palpal organs are well developed, but not very complex, consisting of several corneous lobes and processes of different forms.

The *falces* are of moderate length and strength, a little projecting, and rather prominent near their base in front, where there are numerous long, coarse, prominent bristles.

The *maxillæ* are moderately long; they are broad and strong at and below the insertion of the palpi, which spring from a little more than halfway towards their extremities; they are curved towards the labium, and broadly impressed across the middle of their front surface, and are rounded on the outer side and obliquely truncated on the inner side at their extremities.

The *labium* is of an oblong-oval form, truncated at the apex; the margins are impressed and somewhat constricted, giving to it, as well as to the same portion of structure in many other species of this genus, a peculiar appearance.

The *sternum*, together with the *labium* and *maxillæ*, are of a yellow-brown colour.

The *abdomen* is of ordinary size, and narrow oblong-oval form, well clothed with hairs, and of a sooty black colour; on the fore part of the upperside is a dull, obscure, yellowish-brown, elongate patch, followed by the ordinary six linear spots in two longitudinal opposed curved lines; these are, however, very indistinct; the underside is dull brownish, tinged with yellow. The spinners of the inferior pair are greatly the longest and strongest; the rest are very much smaller, especially those of the central pair, which are almost imperceptible.

This Spider is very nearly allied to *Prosthesima* (*Melanophora*) *læta* (Cambr.), found in Palestine and also in Egypt; but Dr. L. Koch's opinion agrees with my own, that it is quite distinct. There is a slight difference in the structure of the palpal organs; the falces are less prominent at their base in front; and the spinners of the superior pair are, in *P. tristicula*, shorter than in *P. læta*.

The generic distinction between *Prosthesima* and *Drassus* is slight, consisting chiefly in the position of the palpi with respect to the maxillæ: in *Drassus* the palpi arise from the maxillæ at or below the middle, never above it; in *Prosthesima* they issue at or above the middle, *i. e.* nearer to the extremities, but never below it. The maxillæ also are more strongly impressed or constricted transversely in front near the middle.

An adult male of *P. tristicula* was found by myself under a piece of rock near Alexandria, in April 1864.

PROSTHESIMA LUGUBRIS, sp. n. (Plate LI. fig. 7.)

Adult female, length 3 lines.

This Spider is of ordinary form and general structure.

The *cephalothorax* is deep black-brown, its highest point in the profile-line being at the beginning of the hind slope. The *legs*, *palpi*, *falces*, and other fore parts, except the sternum, are deep brown, the *tarsi* being reddish yellow-brown, and the *abdomen* black.

The *eyes* are in the usual two transverse rows, the front row being considerably shorter than the hinder one and slightly curved, the hinder one being straight; the hind central pair are smaller than the hind laterals, and nearer to each other than each is to that of the latter nearest to it; the fore centrals are largest of the eight, and are further from each other than each is from the fore lateral on its side, each fore lateral being in fact nearly, if not quite, contiguous to the fore central next to it. The height of the clypeus is less than half that of the facial space.

The *legs* are moderately long, their relative length being 4, 1, 2, 3. The femora, gemmæ, and tibiæ are more than usually strong; they are well furnished with hairs; and the tibiæ and metatarsi of the third and fourth pairs have some strongish spines; there are also some spines beneath the metatarsi of the first and second pairs, together with numerous papilliform hairs beneath all the tarsi and metatarsi, except perhaps the metatarsi of the fourth pair, which appear to be without them.

The *maxillæ* are rather stronger than usual, but of normal form. The palpi issue from, as nearly as possible, the middle point towards their extremities, which are of a pale yellowish colour.

The *labium* is of a broad oblong form, slightly rounded at the apex.

The *sternum* is similar in colour to the cephalothorax, and seems to be more convex than usual, the central portion, however, being quite flat.

The *abdomen* is black, hairy, of an oblong-oval form, projecting a little over the base of the cephalothorax; the underside of the fore part furnished with strong upturned bristly hairs. The plates of the spiracles are pale yellow-brown, and the genital aperture margined with deep brownish red. The spinners are short; those of the inferior pair strong and longest, those of the superior pair being only just discernible.

A single adult female was found by myself under a stone near Ischl (Upper Austria) in the summer of 1865.

PROSTHESIMA CURINA, sp. n.

Adult male, length 2½ lines.

The *cephalothorax* of this species differs from the majority of the species of this genus in being broader and more truncate before; and the profile line, instead of having its highest point at the thoracic junction and falling gradually in a slightly curving line to the eyes, presents a uniform curve, the highest point being at the occiput; it is of a deep rich reddish-brown colour, sparingly clothed with a few fine palish hairs; the normal grooves and indentations are very slightly marked, and the lateral constrictions at the caput are barely visible. The clypeus is equal to half the facial space.

The *eyes* are in two transverse, straight, parallel rows, forming an oblong figure, whose length is more than double its width; the hinder row is longest, and its two central eyes are smallest of the eight and round, the interval separating them being equal to very nearly two of their diameters, and considerably larger than that which separates each from the hind lateral on its side. The eyes of each lateral pair are separated from each other by nearly the diameter of one of them, there being but little difference in their size. The eyes of the fore central pair are (apparently) but little larger than the hind centrals; the interval between them is less than two diameters, and that between each and the fore lateral on its side is equal to about the diameter of the former.

The *legs* are rather long and moderately strong; their relative length is 4, 1, 2, 3; they are of a deep brown colour, getting paler towards the extremities, the tarsi being pale yellowish.

The *palpi* are not very long nor strong, but similar in colour to the legs; the cubital and radial joints are equal in length; the latter has its outer extremity produced into a strongish, tapering, bluntish-pointed apophysis, rather less in length than the joint itself; the digital joint is of ordinary form, rather large, and its length exceeds that of the radial and cubital joints together. The palpal organs are simple and have a short, strong, curved, bluntish-pointed, corneous process or spine near their extremity.

The *falces* are long, strong, projecting, and considerably arched or prominent near their base in front; they are similar to the cephalothorax in colour, and their fore sides are covered with black granulations or small tubercles; from some of these issue strong bristly hairs; and probably from the rest similar bristles had been rubbed off.

The *maxillæ* are of normal form. The palpi issue from above the middle point towards their extremity; they are of a deep yellow-brown colour, paler at the extremities.

The *labium* is of normal form, and similar to the cephalothorax in colour.

The *sternum* has numerous prominent bristly hairs round its margin; and its general surface appeared to be covered with minute punctures; its colour is similar to that of the maxillæ.

The *abdomen* is of an oblong-oval form, and projects over the base of the cephalothorax; it is black, clothed with hairs, and has a deep-brown coriaceous patch at its fore extremity on the upperside. The spinners are blackish and of ordinary size; those of the inferior pair are double the length of the superior pair, but about equal in strength.

A single adult male was found at Alexandria, under a stone, by myself in April 1864.

PROSTHESIMA NILICOLA, sp. n. (Plate LI. fig. 8.)

Adult male, length 1½ line.

This small but very distinct species is of ordinary general form and structure.

The *cephalothorax* is glossy, and of a rich deep brown colour, narrowly margined with black; the ordinary grooves and indentations are barely visible, and the lateral constriction at the caput is very slight.

The *eyes* are placed in the usual two transverse lines; the hinder row is slightly the longest and straight, the fore one a little curved; the eyes of the hind central pair appear to be the smallest of the eight, and the fore laterals the largest; the hind laterals are very small and obliquely placed; the four eyes of the hinder row are equidistant from each other; each hind lateral is separated from the fore lateral on its side by rather less than the diameter of the former; the fore laterals are large, slightly obliquely placed, of a somewhat oval form; the fore centrals are also large, round, and contiguous to each other, and each is contiguous to the fore lateral on its side.

The *legs* are rather long and strong, particularly the femoral joints; their relative length is 1, 4, 2, 3; they are of a dark brown colour tinged with olive; the two basal joints, however, as well as the metatarsi and tarsi, are yellow-brown; the tarsi of the fourth pair are palest and tinged with red; they are furnished with hairs; and there are some not very strong spines, principally on the tibiæ and metatarsi of the third and fourth pairs.

The *palpi* are short, tolerably strong, and of a yellow-brown colour; the cubital and radial joints are very short, but of equal length; the latter has its outer extremity produced into a not very long, tapering, deep- shining brown apophysis, whose pointed extremity curves upwards; the digital joint is large and of a broadish oval form, its length exceeding that of the radial and cubital joints together. The palpal organs are well developed: they consist of several largish prominent corneous lobes and processes; and a long tapering black spine issues from their fore extremity and forms a bold coil or bend near the middle of their outer side, from which part also there issues another much shorter, curved, prominent, pointed, black spine.

The *falces* are neither very long nor strong; they project forwards, and, with the maxillæ, labium, and sternum (which are all of normal character), are of a dark yellowish-brown colour.

The *abdomen* is oblong-oval in form, and rather flattened; it is moderately clothed with hairs and of a nearly black colour; a large patch of a subtriangular form occupies the fore part; this patch is of a rather shining coriaceous nature and deep brown colour; beneath the fore part are some long, strong, upturned, bristly hairs.

A single example was found by myself under a stone near Alexandria in April 1864.

PROSTHESIMA MOLLIS, sp. n. (Plate LI. fig. 9.)

Adult female, length 2¾ lines.

In its general yellow colouring this species resembles *P. pallida* (*postea*, p. 383); but it may be easily distinguished by the closer grouping of the eyes, the two rows of which, however, are further apart, the hinder row being much more curved; the spinners of the inferior pair are also much shorter; the legs too are shorter, and the genital aperture differs greatly in form.

There is nothing noticeable as different from the normal type in the form of the cephalothorax, except that the lateral constriction of the caput is rather more marked; it is (as well as the whole of the rest of the fore part) of a pale orange-yellow colour, and differs but little in size.

The *eyes* are large, and are placed, as usual, in two transverse curved rows, of which the foremost one is slightly the longest, and the hinder one the most curved, the area they describe being no more than one third longer in its transverse than in its longitudinal diameter: the hind centrals are oval, oblique, of a pearl-grey colour and margined with black; they are very near together and not quite contiguous; and the interval that separates them is about equal to that which divides each from the hind lateral nearest to it, being no more than one fourth of a hind central eye's diameter: each hind lateral is separated by half its diameter from the fore lateral next to it, and is contiguous to the fore central eye on its side. The fore centrals are unusually large for these eyes, being as large or larger than the fore laterals; they are round, dark-coloured, separated from each other by rather less than half a diameter, and (like the same eyes in many others of the genus) placed on somewhat of a slight eminence: the four lateral eyes are margined with black, and of a pearl-grey colour, but not quite so dark as the hind laterals.

The *falces* are small and almost vertical.

The *legs* are shortish; relative length 4, 1, 2, 3, moderately strong, furnished sparingly with hairs, and with a few short weak spines on the tibiæ and metatarsi of the two hinder pairs; there are also one or two longer and stronger ones on the fore sides of the femora of the same pairs.

The *maxillæ* are normal in size and form; but the palpi issue from the middle point of their length.

The *labium* also is normal.

The *abdomen* is oblong-oval, truncated before; it is sparingly clothed with hairs, and is of a pale dull luteous yellow colour; it projects but very slightly over the base of the cephalothorax, and at that part has some strong upturned bristles: four impressed dusky spots form a largish quadrangular figure on the fore half of the upper side; this figure is longer than broad, and its fore side is slightly shorter than the hinder one: a narrow, somewhat tapering, indistinct dusky marking is defined by two nearly parallel dusky lines along the middle of the fore half, running between the two foremost of the above-mentioned spots. The spinners of the inferior pair are not as long as in many other species, but much longer than those of the superior pair. The form of the genital aperture is simple, but peculiar (*vide* Plate LI. fig. 9).

A single adult female was found by myself under a stone near Alexandria, in April 1864.

PROSTHESIMA CINGARA, sp. n. (Plate LI. fig. 10.)

Adult female, length not quite 3 lines.

In general form and structure this species presents nothing peculiar, and in its dark and sombre colouring it much resembles *P. pedestris* (Koch) and *P. tristicula* (Cambr.); the form of the cephalothorax is oval, most pointed before; the lateral constrictions at the caput are very slight; and the nórmal grooves and indentations are indicated by blackish lines, the ground-colour of the cephalothorax being a rich deep brown, as also is that of the legs (except the tarsi, which are reddish yellow-brown), the palpi, falces, maxillæ, labium, and sternum—the extremities of the maxillæ, however, being pale; the abdomen is black, the spinners deep brown, and the spiracular plates yellow-brown.

The *eyes* are in two almost straight transverse lines, the foremost being the shortest. The interval separating those of the hind central pair (which are small, oval, but not oblique) is rather less than that which divides each from the hind lateral next to it. The four laterals are larger than the four centrals, those of the front row being the largest of the eight; and each of these is separated from the hind lateral on its side by an interval equal to that which divides each hind lateral from the hind central nearest to it; each fore central is very nearly contiguous to the fore lateral on its side, the interval between the two fore centrals being apparently greater than the diameter of one of them; but these eyes are so dark and indistinct that it is not easy to see their exact position. The figure formed by the eight eyes is an oblong whose length (*i. e.* transverse diameter) is as nearly as possible double its longitudinal diameter (or width). The height of the clypeus is low, being less than half that of the facial space.

The *legs* are moderately long and strong, the femora being peculiarly strong and incrassated on their uppersides; they are furnished with hairs; and the tibiæ and metatarsi of the third and fourth pairs have some tolerably strong spines; the two terminal tarsal claws of the fourth pair are rather longer, stronger, and less curved than the rest.

The character of the maxillæ and labium is normal.

The *falces* are moderate in length and strength, a little projecting forwards and arched near their base in front, where they are furnished with strong bristly hairs.

The *abdomen* is oblong-oval, very sparingly clothed with hairs; it projects a little over the base of the cephalothorax. The inferior pair of spinners are longest and strongest, but not so disproportioned in size to the others as in *P. tristicula* and some others; the genital aperture is of characteristic form (*vide* Plate LI. fig. 10), and yellow-brown, with deep red-brown margins.

Three adult females of this species were found by myself in May 1864, under stones at Corfu.

PROSTHESIMA PALLIDA, sp. n. (Plate LI. fig. 11.)

Adult male, length 3 lines; adult female 3½ lines.

This species will be readily distinguished by the almost immaculate yellow colour of the whole of the fore part, *i. e.* all except the abdomen, which is of a yellowish mouse-coloured brown above, the underside being pale dullish yellow.

The *cephalothorax* is of the ordinary form, rather narrower and a little more constricted laterally at the caput than in *P. tristicula*; it is moderately arched above, the profile-line sloping forwards, with a slight general curve from the thoracic junction to the eyes; the normal grooves and indentations are fairly marked, and of a slightly dusky hue.

The *eyes* are large, rather closely grouped, and in two nearly parallel slightly curved lines of equal length, the curve directed outwards; and the height of the clypeus is considerably less than half that of the facial space. The four eyes of the hinder row are equally separated from each other, the intervals, however, being very small; the eyes of the hind central pair are larger than the hind laterals, oval, and a little obliquely placed; they are pearly, of a grey hue, the laterals of both rows being pearly also but white, the fore centrals dark; these last are the smallest of the eight, and the interval between them is greater than that between each and the fore lateral on its side, the fore laterals being very nearly contiguous to the fore centrals, oval, oblique, and apparently the largest of the eight, though not much larger than the hind centrals, and each is separated from the hind lateral on its side by an interval about equal to the diameter of the latter. The length of the curved oblong figure formed by all the eyes is, as nearly as possible, double that of its width.

The *legs* are moderately strong, rather long, their relative length being 4, 1, 2, 3; they are furnished sparingly with hairs and slender bristles, with a few spines on the tibiæ and metatarsi of the two hinder pairs; each tarsus ends with two curved claws, pectinated at their base; the claws on the tarsi of the fourth pair of legs are longer and rather stronger than the rest.

The *palpi* are rather short and not very strong; they are furnished with hairs and bristles, a rather conspicuous tapering black bristle issuing from the fore extremity on the upperside of the cubital joint; this joint and the radial are of equal length; the latter is rather less strong than the former, and has its fore extremity on the outer side produced into a small, tapering, bluntish-pointed apophysis, not much exceeding in length one third that of the joint itself. The digital joint is not very large; it is of ordinary form; and its length is considerably less than the united lengths of the radial and cubital joints. The palpal organs are simple but well developed, consisting of a large, oval, corneous lobe, broken up at its fore part into one or two irregular corneous processes.

The *falces* are strong, moderately long, a little projecting forward, arched, but not very prominent near their base in front, where they are furnished with some prominent bristles.

The *maxillæ* are strong, moderately long, inclined as well as curved towards the labium, and strongly impressed across the middle of the front surface; the point of issue of the palpi is slightly above the middle point between the base and extremity; at this point the maxillæ are very broad and strong: in these and other respects there is no difference from the generic type.

The *labium* is two thirds of the length of the maxillæ, of an oblong form, rounded a little on the sides as well as at the apex.

The *sternum* is of ordinary form; it is glossy and has its margins furnished pretty thickly with prominent black bristly hairs, of which also there are some on the front of the maxillæ.

The *abdomen* is short, oblong-oval in form, sparingly clothed with hairs, and projects over the base of the cephalothorax, the projecting portion furnished with numerous, recurved, strong bristles; it has a faint indication of a narrow palish wedge-shaped marking on the fore half of the upperside. The spinners of the inferior pair are long, strong, and cylindrical, and about three times the length of those of the superior pair.

The female is rather larger than the male, but resembles it in form, general structure, and colours.

The form of the genital aperture is peculiar, but not remarkable in its development; it consists of two rather small, oblong-oval, opposed openings united at their fore part; and beneath each of them is a round, red-brown, shining, corneous-looking, convex boss or spot.

An adult example of each sex was found by myself under stones near Alexandria, in April 1864.

Genus DRASSUS, Walck.

DRASSUS NIGROFEMORATUS, sp. n. (Plate LI. fig. 12.)

Adult male, length 2¾ lines.

The *cephalothorax* of this very distinct species is of ordinary form; its colour is a clear reddish yellow-brown, clothed with a few greyish pubescent hairs on the hinder part, and some longish bristles directed forwards in the ocular region; the normal indentations are of a deeper, duskier colour.

The *eyes* are in two curved nearly parallel rows, the hinder one of which is the longest. The eyes of the fore central pair are the largest of the eight; they are separated from each other by about half of an eye's diameter, and each is contiguous to the lateral of the same row on its side; those of the hinder row are equally separated from each other; and those of each lateral pair are wide apart; in fact the position of the eyes is more like that of *Gnaphosa* than the usual type of *Drassus*. Dr. Koch seems to have been in doubt to which of these genera to refer it; but the form of the *maxillæ* appears to me to be decidedly that of *Drassus*.

The *legs* are moderately long and rather strong; they are of a reddish-yellow colour, except the femora, which are quite black, and are furnished with a few hairs and spines; each tarsus ends with two curved pectinated claws, beneath which is a small claw-tuft or scopula.

The *palpi* are short and strong, and of a dark yellowish-brown colour. The radial joint is, if any thing, rather shorter than the cubital, and has its outer extremity continued in a long, tapering, curved, blunt-pointed apophysis, directed upwards and rather over the hinder part of the digital joint; this apophysis is more than double the length of the joint itself, and extends to half the length of the digital joint; this latter joint is of tolerable size and oval form; and the palpal organs are well developed but compact, consisting of several corneous spines and processes.

The [illegible] are neither very [illegible]
and [illegible] [illegible], and of a dark [illegible]
The maxillae and labium are [illegible]
[illegible] [illegible], the former [illegible]
The sternum is oval and similar [illegible]
The abdomen is of an oblong [illegible]
[illegible] it has a pale transverse band [illegible]
white hairs; behind this on either s
of one yellowish mid-brown, and be
the length of the abdomen, is an [illegible]
[illegible] [illegible] stripe running over
[illegible] [illegible] backwards; the
the middle of the abdomen, but they
[illegible] above the spinners also is a trans
band of white hairs. A large squari
[illegible] on the underside is of a pale
as well as the space between them
spinners.

A single adult male from Italy; d
received it as near Naples.

[illegible] [illegible], sp. n. (Pla

Adult male, length 2 lines.

The cephalothorax of this very
[illegible] yellow-brown colour, with the
and [illegible] marked with black;
convex as in profile, the occiput is rou
either the thoracic junction or the occ
almost all black; the height of the cly
is about one third that of the facial sp

The eyes are of moderate size and n
they are in two transverse rows (the
curved from each other, forming an ob
its longest part is rather more than do
part; the four eyes of the hinder row
white, and equidistant from each other
rather exceeding an eye's diameter. T
smaller, being the smallest of the eigh
length to the hind centrals, the interval
than an eye's diameter; and each of the
contiguous, to the fore lateral on its side;
lateral and the hind lateral on its side i
of the latter; while the interval betwee
hind lateral nearest to it is about
former.

The *legs* (in the only exam
but they appeared to be und
length 4, 1, 2, 3: they are
pairs are black, furnished
those of the third and

such of the legs as were still uninjured were two, black and small; and beneath them is a scopula of short hairs extending backwards over the inferior surface of the joint.

The *palpi* are strong and moderately long; the humeral joint is of unusual strength, being considerably prominent above towards its hinder extremity, lessening gradually forwards; their colour is dusky yellow-brown. The radial joint is shorter and less strong than the cubital; it is furnished with numerous strong bristly hairs on its inner side, and has its outer extremity produced into a strongish apophysis, equal to the joint in length, rather enlarged and roundly obtuse at its extremity. The digital joint is large, and its length considerably exceeds that of the radial and cubital joints together. The palpal organs are large, highly developed, and very prominent, consisting of a large, nearly globular lobe with several dark sinuous markings on its surface, giving the appearance of closely applied spines; this lobe is rather drawn out at its fore extremity, where it is also apparently slightly cleft or divided.

The *falces* are moderately long, rather slender, and nearly vertical; when looked at from in front, the maxillæ are seen to extend considerably on either side of them; they are of a dark reddish-brown colour.

Maxillæ long and strong, and very slightly inclined towards the labium; they are laterally prominent at their extremity on the outer side, and round on the inner side; the outer profile-line, when looked at with the Spider flat upon its back, is hollow; the line and impression on their front surface is general, but not great.

The *labium* is more than half the length of the maxillæ; it is oblong, rounded at the apex, and (with the maxillæ) is of a deep yellow-brown colour.

The *sternum* is of a rather elongate-oval form; and its colour is yellow-brown, slightly tinged with reddish.

The *abdomen* is oblong-oval, broadest and bluff behind and truncate before, where it projects over the base of the cephalothorax; it is hairy, and its colour is black. The fore half of the upperside is almost entirely occupied by a large patch of a deep reddish brown, shining, coriaceous nature; this patch is roundly pointed behind, its side margins being also rather rounding, and it lies exactly within a quadrangular figure occupying the largest portion of the fore part of the abdomen, and formed by four pale whitish spots: following the hinder pair of these spots, which are impressed and indicated by white hairs, are two others on the hinder half of the abdomen, rather nearer together, but also impressed, and shown by two short transverse lines of white hairs. The spinners are dusky black, not very long, those of the superior pair being very slightly shorter than those of the inferior pair, and not quite so strong: the spiracular plates are large, and of a clear pale yellow colour; between them the opening leading to the spermatic tubes is unusually visible and of a semicircular form; this opening is seldom visible in male Spiders, being usually an imperceptible slit.

A single example of the adult male of this Spider was found among

Two adult females were received from Bombay in a collection (before alluded to) made for me by Major Julian Hobson, Staff Corps.

DRASSUS LURIDUS, sp. n. (Plate LII. fig. 21.)

Adult male, length 3 lines; adult female, length 4 lines.

This species is nearly allied to *D. vulpinus* (*postea*), but is destitute of the silky yellow-grey pubescence with which that and other species are clothed. The whole of the fore part is yellow, tinged with red-brown, the *falces* and *labium* being rather darker.

The *cephalothorax* is glossy, of ordinary form, with the normal grooves and indentations fairly marked, and a few fine yellowish hairs here and there; perhaps more of them may have been rubbed off. The height of the clypeus is rather less than half of that of the facial space.

The *eyes* are in two transverse curved rows, the curves directed backwards; those of the hinder row, which is longest and much the most curved, are equally separated from each other; those of the central pair of this row are oval and oblique, and, as well as those of the lateral pairs, of a pearly white colour; the eyes of the fore central pair are large, round, and dark-coloured, and separated by an interval of half an eye's diameter, and each is as nearly as possible contiguous to the lateral of the same row on its side.

The *legs* are rather long and strong; their relative length is 4, 1, 2, 3; they are furnished with hairs and spines, the latter chiefly on those of the two hinder pairs; and each tarsus terminates with two curved claws, beneath which is a scopula, which extends backwards beneath the tarsal joint.

The *palpi* are moderate in length and strength, and of the same colour as the legs. The radial is a little shorter than the digital joint, and has a group of some longish hairs beneath its fore extremity as well as others above, and at its outer extremity is a strongish apophysis, which terminates obliquely and in a point on its upperside; the digital joint is of moderate size, darker in colour and rather less in length than the radial and digital together, and of a narrow oval form. The palpal organs are well developed, but simple, consisting of a large oval corneous lobe, with a kind of marginal fillet on the outer side, and a small curved sharp-pointed spine at their inner extremity.

The *falces* are moderate in length and strength, they project forwards and are a little prominent at their base in front.

The *maxillæ*, *labium*, and *sternum* are of ordinary form.

The *abdomen* is small, oval, and of a pale yellowish colour, suffused more or less with blackish behind; on the fore half of its upperside is a longish wedge-shaped, dull, indistinct marking, on either side of the hinder half of which are three dark punctures, forming a slightly curved line on each side, similar to corresponding punctures in many others of this family. The spinners are long; those of the inferior pair are just about double the length and strength of those of the superior pair.

The *female* resembles the male in colours and markings; the relative length of the spinners, however, differs, those of the superior pair being longer and stronger in proportion to the inferior ones, the length of the former being but a very little less than that of the latter; the genital aperture is not very large, but of very simple though characteristic form (*vide* Plate LII. fig. 21, *c*).

An adult example of each sex was contained in the collection of Spiders received from Bombay from Major Julian Hobson, Staff Corps.

DRASSUS VULPINUS, sp. n. (Plate LII. fig. 22.)

Adult female, length 5½ lines.

This fine species belongs to the group which includes *D. sericeus* (Bl.), to which it is nearly allied.

The *cephalothorax* (which is of ordinary form), and also the *legs* and *palpi*, are of a foxy yellow-brown, clothed with fine silky adpressed hairs or pubescence of a yellowish-grey colour.

The *falces*, *maxillæ*, *labium*, and *sternum* (all of which are of ordinary form) are darker-coloured than the cephalothorax, and furnished, in addition, with black prominent bristly hairs. The *abdomen* is of a dull brownish-yellow colour, thickly clothed with silky yellow-grey hairs, mixed with coarser black ones.

The *eyes* are in two curved rows; the hinder row is the most strongly curved, the curve directed backwards; and the front row, looked at from above and behind, is curved the same way, but less strongly; the lateral eyes (on either side) are separated from each other by an interval about equal to the diameter of the fore lateral eye; the eyes of the hind central pair are bright pearly white, oval, oblique, and rather nearer together than each is to the lateral on its side; those of the fore central pair are round and about half of an eye's diameter apart, each being also separated by an equal distance from the lateral on its side.

The *legs* are tolerably long and strong; relative length 4, 1, 2, 3; and besides a yellow-grey pubescence, they are furnished with other hairs and strong spines, the latter mostly on those of the two hinder pairs. Each tarsus ends with two curved pectinated claws, beneath which is a strong scopula extending over the lower side of the greater part of the tarsal joint.

The *palpi* are short, strong, and similar in colour and armature to the legs; the hairs at the end are rather dense and prevented my seeing the terminal claw, which, if present, must be very short.

The *abdomen* is oval, and projects well over the base of the cephalothorax; its colour and clothing have been remarked upon above. The spinners are yellow-brown in colour, longish, and prominent; those of the inferior pair are the strongest and rather the largest. The genital aperture is of moderate size and simple form, with a deep red-brown corneous margin (*vide* Plate LII. fig. 22).

A single adult example of the female was found by myself in an old building at Cairo in April 1864.

DRASSUS [illegible], sp. n. (Plate LII. fig. 23.)

Adult female, length [illegible] lines.

The colour of the fore part of this Spider is of a rusty yellow-brown hue, the falces, maxillæ, labium, and sternum being rather the darkest—the falces and labium indeed being of a darkish red-brown, the abdomen being pale dull yellow.

The *cephalothorax* is of ordinary form, but rather small and short in proportion to the length of the abdomen, and it is sparingly clothed with fine hairs. The normal furrows and indentations are slightly marked, but are of a deeper hue than the rest of the surface. The height of the clypeus is less than half that of the facial space.

The *eyes* are in the usual position; they are in two equally curved transverse rows, the ends of which converge on each side but do not meet. The four central eyes form a trapezoid whose transverse is less than its longitudinal diameter; those of the hind central pair are oval, oblique, and separated by an interval about equal to the longest diameter of one of them; the interval between each of these and the hind lateral on its side is greater than that between the two centrals. Those of the foremost row appeared to be equally separated from each other.

The *legs* are short, moderately strong, furnished with hairs and a few black spines, these last almost all on the two last pairs; each tarsus ends with two curved, toothed claws, beneath which is a scopula which extends backwards underneath the joint; their relative length is 4, 1, 2, 3.

The *palpi* are neither very long nor strong, but they project a little forwards and are of ordinary form.

The *maxillæ*, *labium*, and *sternum* present no deviation from the normal characters of the genus.

The *abdomen* is of an elongate oblong-oval form, very sparingly clothed with hairs, and of a uniform dull yellowish colour. Spiracular plates yellow and not very large. Genital aperture small, but, as usual, of characteristic form (*vide* Plate LII. fig. 23). The spinners are moderate in length and strength; those of the inferior pair are the longest and strongest.

A single example of the adult female of this species was contained in the collection of Spiders kindly made for me in Bombay by Major Julian Hobson, Staff Corps.

DRASSUS DENOTATUS, sp. n. (Plate LII. fig. 24.)

Adult female, length 3½ lines.

The general form and structure of this Spider are of the ordinary character; but the markings on the abdomen are distinct and characteristic, as also is the form of the genital aperture.

The *cephalothorax* is pale yellow-brown thinly clothed with hairs; the caput is a little more convex than usual, and it is divided behind from the thorax by two fine blackish converging lines, divided at the point of convergence by another longitudinal central one. The height of the clypeus is less than half that of the facial space, being about equal to the diameter of one of the fore central eyes.

The *eyes* are of tolerable size and in the usual position; but the curve of each row is nearly equal, making the two rows almost parallel; the hinder row is the longest, and its two central eyes are large, pearly white, and very nearly contiguous to each other, the lateral on either side being separated from them by about the diameter of one of the centrals; the fore centrals are also large, but not quite so large as the hind centrals, though forming a line of the same length, the interval between them being rather more than half of the diameter of one of them; the eyes of each lateral pair are separated from each other by an interval of about the diameter of one of them.

The *falces* are moderate in length and strength; they are prominent at their base in front, projecting forwards, and are of a dark yellow-brown colour.

The *legs* are rather short, moderately strong, furnished with hairs and spines, the latter chiefly on the two hinder pairs; their relative length is 4, 1, 2, 3, and they are of a yellow colour.

The *palpi* are similar to the legs in colour, deepening to yellow-brown on the radial and digital joints, and they are furnished with hairs and a few black spines.

The *maxillæ* and *labium* are of normal form; the former is yellow-brown, the latter considerably darker.

The *sternum* is oval, pointed behind, and similar in colour to the cephalothorax.

The *abdomen* is oval, rather truncate before, where it projects a little over the base of the cephalothorax; it is thinly clothed with hairs, and of a dull brownish black hue, speckled and marked with pale yellowish: on the upperside a dusky, elongate, tapering or wedge-shaped marking occupies the central longitudinal line of the fore half: on either side of the hinder or pointed end of this marking are two small, pale, elongate spots; and following it, towards the spinners, in a longitudinal series, are 6 or 7 transverse angular bars or chevrons of a pale dull yellow colour; and the vertex of each of these runs into the angle of the one preceding it. The dark ground-colour of the abdomen is disposed in parallel striæ towards and on the sides; and the intervals between the yellowish angular bars themselves form dark broken chevrons. On the underside are two longitudinal and rather pale yellowish lines, which converge at a little distance from the spinners; and at the extremity of these lines on either side is a curved row of three round pale yellowish spots, more distinct than the rest. The spinners are moderate in length and strength, those of the inferior pair being the longest, and their colour is similar to that of the legs. The genital aperture is large and of peculiar form (*vide* Plate LII. fig. 24).

A single adult female was found by myself at Cairo.

DRASSUS PUGNAX, sp. n. (Plate LII. fig. 25.)

Adult male, length 3½ lines.

The *cephalothorax* of this species is short, oval, rather more pointed before than in many others of the genus, but in other respects of normal form; it (as well as all the rest of the fore part of this Spider) is of a rather bright yellow-brown colour, clothed, but not at all densely, with greyish-yellow pubescence, and some prominent black bristly hairs in the ocular region; the normal grooves and indentations are not strong, but are well indicated by being of a rather deeper hue than the rest.

The *eyes* are in the ordinary position, two transverse curved rows; the front row is the most curved, the hinder one being very nearly straight; the lateral eye of each row is nearer to the opposite lateral eye of the other row than the central eyes of the one are to those of the other; the eyes of the hinder row are equidistant from each other and of about equal size; those of the front row are large, all larger than those of the hinder one, and the fore central pair much the largest of the eight; each of these latter is very nearly contiguous to the lateral of the same row on its side, and they are separated from each other by nearly about half of an eye's diameter.

The *legs* are strong, especially the femoral joints, and moderately long, their relative length being 4, 1, 2, 3; they are furnished with hairs, spines, and bristles; and each tarsus ends with two curved claws, beneath which is a claw-tuft or scopula.

The *palpi* are pretty strong, but not very long. The radial and cubital joints are short; the former is rather the shortest but strongest, and has its outer extremity produced into a long and strong apophysis; this is a little tapering at first, but has its extremity divided into two very peculiar and distinct limbs; one of these (the upper one) is strongly bent inwards and sharp-pointed, the other obtuse and straighter. The digital joint is large, of the ordinary oval form, and of a darker hue than the rest of the joint. The palpal organs are well developed but simple, having some longitudinal, parallel, dark, sinuous markings on the surface of the principal corneous lobe, and a small curved corneous process at their fore extremity; the humeral joint has three curved, black, spine-like bristles near its fore extremity on the upperside; two are near the margin, and the third a little way behind.

The *falces* are vertical and not very long nor strong; the *maxillæ*, *labium*, and *sternum* are of normal form.

The *abdomen* is oval, rather truncate before, and projecting over the base of the cephalothorax; it is of a uniform pale brownish-yellow hue, clothed sparingly with fine yellowish-grey hairs; and on the fore part of the upperside is a large bright yellow-brown patch of a shining semicorneous nature, similar in colour to the cephalothorax and other fore parts; this patch is of a curvilinear, tapering form; and along its centre is indistinctly visible an elongate tapering, and rather darker marking, the sharp point of which extends beyond its hinder and pointed extremity: also on the fore part of the upperside of the abdomen are four impressed spots or dark punctures in an oblong quadrangular figure; the foremost pair of these spots are rather obscured by the shining patch above described. The spinners are yellow-brown, rather long and strong, those of the inferior pair stronger and about one third longer than those of the superior pair. The spiracular plates are very nearly of the same colour as the rest of the abdomen, and, like it, clothed with hairs.

A single adult male of this Spider was found by myself among débris of an old wall at Cairo. It may be distinguished easily by the peculiar form of the radial apophysis, and large size of the fore central pair of eyes.

Genus MICARIA (Westr.).

MICARIA ARMATA, sp. n. (Plate LII. fig. 26.)

Adult female, length 1¾ line.

This exceedingly brilliant little Spider belongs to a group of the genus *Micaria* whose eyes are in the position of those of the genus *Gnaphosa*, and the abdomen connected with the cephalothorax by a distinct pedicle. M. Lucas has described two species of this group, in his work on Algerian Spiders, in the genus *Drassus*. Dr. L. Koch has, in his work on the Drassides, included these species as (to him) unknown species of the genus *Gnaphosa*, probably so allocating them from the strongly marked position of the eyes. I cannot, however, find any difference in the form of the maxillæ from *Micaria*; and the whole appearance, form, and brilliancy of colouring (in the present instance) connects these Spiders unmistakably with *Micaria* rather than with *Gnaphosa*.

Micaria armata may be distinguished at once by the palpi as well as the tibiæ and metatarsi of the legs of the first pair being armed with long, strong spines.

The *cephalothorax* is oval, rather narrow before, and but slightly constricted laterally at the caput; it is of a brownish-yellow colour, the caput being dark brown, the whole clothed with scaly hairs reflecting the most brilliant metallic tints of gold, violet, purple, and green.

The *eyes* are in two transverse, rather widely separated, curved rows, the curves directed towards each other; the foremost row is much the shortest, and the eyes composing it are almost, but not quite contiguous to each other; the laterals of this as well as of the hinder row are larger than the centrals; the hind centrals are oval, oblique, and further from each other than each is from the lateral of the same row on its side; the eyes of each lateral pair are as widely separated from each other as the lateral eyes of the foremost row. The height of the clypeus is equal to the space between the fore and hind central pairs of eyes.

The *legs* are long and slender; their relative length appeared to be 4, 1, 2, 3; they are of a pale yellow colour, with a strong longitudinal black stripe on the femora of the 2nd, 3rd, and 4th pairs, the lower part of those of the first pair being black: beneath the metatarsi and tibiæ of the first pair are some long, strong, prominent, divergent spines, apparently articulated to small tubercles; one pair of these are beneath the metatarsi, two pairs beneath the tibiæ, and a single one issuing from a black spot inside each of the femora; besides these spines the legs are only furnished, and that sparingly, with hairs.

particulars as those which distinguish this latter species from *D. ægyptius*, the difference, too, being similar.

The *falces* in the present Spider more nearly resemble those of *D. lapidicolens*, being larger than those of *D. ægyptius*, and projecting forwards instead of being nearly vertical.

The radial joint of the palpus has no apophysis from its fore extremity, and had only one or two strongish spines at its fore extremity on the inner side; others, however, may have been rubbed off. The palpal organs are similar in their general form and processes; but the curved spine issuing from their base and running round the inner margin is stronger, the corneous prominence at their fore part is longer, stronger, and curved, and, instead of three spines in a transverse row beneath the fore part of the digital joint, there is in the present species only one strong spine.

On the outer margin of the palpal organs are two longitudinal parallel reddish-brown lines, which rather converge and become serpentine or strongly convoluted at the hinder extremity.

A single adult male was found by myself among the débris of a wall near Alexandria, in April 1864.

DRASSUS ÆGYPTIUS, sp. n. (Plate LII. fig. 19.)

Adult male, length 3½ lines; adult female, length 4½ lines.

This species is very nearly allied to the well-known *D. lapidicolens* (Walck.). It is, however, smaller than the usual run of that species, and a paler and yellower Spider in its general colouring; the cephalothorax wants the narrow black marginal line; the spines on the legs are longer and slenderer; and the abdomen has not the longitudinal dark elongate marking on the fore half of its upperside, always more or less distinct on that of *D. lapidicolens*. The falces also, which are long and porrected in that species, are much shorter in the present and nearly vertical.

A strong distinguishing character is (as usual) presented by the palpi and palpal organs of the male: the radial joint has its upperside furnished with some long slender spines; but it is destitute of any projection or apophysis at its fore extremity, which is a little broader than its hinder portion. The digital joint is narrow and elongate. The palpal organs, which occupy about half the length of its underside, consist of a nearly round pale lobe; from near the inner side of the hinder extremity of this lobe a slender tapering black spine issues and curves round the outer margin in rather close contact with it, terminating in a fine point near its fore extremity; on the face of the lobe near the fore part is a very small blackish-brown tubercular eminence or short blunt spinous prominence; and from its outer extremity before issues an obtusely ending prolongation directed inwards; beneath the fore extremity of the digital joint, near the palpal organs, are three conspicuous and characteristic black spines, directed forwards and placed in a transverse line.

The *eyes* are very similar, both in size and position, to those of *D. lapidicolens*; those, however, of the foremost row are rather nearer the fore margin of the caput, leaving a narrower clypeus than in that species.

The whole of the fore part, including the legs and palpi, is of a pale uniform straw-colour, thinly clothed with silky hairs, the abdomen being a little darker and duller in its hue, clothed with yellowish fine hairs, some coarse bristly ones being turned upwards over the fore part. The female resembles the male in colour and general characters, but is larger, and the form of the genital aperture is characteristic.

The legs (in both sexes, but most conspicuously in the female) terminate with a small claw-tuft beneath the terminal tarsal claws, and a scopula beneath the whole length of the tarsi and metatarsi.

An adult example of each sex was found under stones at Alexandria, Egypt, by myself, in April 1864.

DRASSUS ASTROLOGUS, sp. n. (Plate LII. fig. 20.)

Adult female, length 4½ lines.

The whole of the fore part of this Spider is of a brightish yellow colour, the falces being slightly tinged with reddish brown, and the abdomen being of a dull pale whitish yellow.

The *cephalothorax* is of ordinary form, but rather short and small in proportion to the abdomen, which is more than double its length; the normal grooves and indentations are slightly dusky, and a short red-brown line indicates the thoracic junction; the height of the clypeus is less than half that of the facial space.

The *eyes* are placed in two transverse curved rows (the curve directed backwards); the front row is the shortest and least curved; the eyes of the hinder row are as nearly as possible equidistant from each other; those of its central pair are oval, but not oblique; the eyes of the fore central pair are the largest of the eight, round, and separated from each other by half of an eye's diameter; these are dark; all the rest are pearly white, but have black veins; each fore lateral eye is, as nearly as possible, contiguous to the fore central nearest to it; the interval between the eyes of each lateral pair is equal to about half the diameter of the hinder one; the four central eyes form a trapezoid whose transverse is less than its longitudinal diameter.

The *legs* are neither very long nor strong; they are furnished with a few hairs and spines; each tarsus ends with two curved pectinated claws, beneath which is a scopula, extending backwards under a part of the tarsal joint.

The *falces* are of ordinary form, but small, vertical, and a little prominent near their base in front.

The *maxillæ*, *labium*, and *sternum* are of normal form.

The *abdomen* is large, oval, and considerably convex above. It is of a uniform dull pale whitish yellow colour, clothed with but few hairs, scarcely any unless they had been rubbed off. On the fore half of the upperside are the usual six impressed spots, not very distinct, in two opposed longitudinal curved rows of three each. The spinners are tolerably long, those of the inferior pair being the strongest; the genital aperture is yellow-brown in colour, simple, of tolerable size, and of a somewhat oblong form.

DRASSUS FERRUGINEUS, sp. n. (Plate LII. fig. 23.)

Adult female, length 4¾ lines.

The whole of the fore part of this Spider is of a rusty yellow-brown colour, the falces, maxillæ, labium, and sternum being rather the darkest—the falces and labium indeed being of a darkish red-brown, the abdomen being pale dull yellow.

The *cephalothorax* is of ordinary form, but rather small and short in proportion to the length of the abdomen, and it is sparingly dotted with fine hairs; the normal furrows and indentations are slightly marked, but are of a deeper hue than the rest of the surface. The height of the clypeus is less than half that of the facial space.

The *eyes* are in the usual position; they are in two equally curved transverse rows, the ends of which converge on each side but do not meet; the four central ones form a trapezoid, whose transverse is less than its longitudinal diameter; those of the hind central pair are oval, oblique, and separated by an interval about equal to the longest diameter of one of them; the interval between each of these and the hind lateral on its side is greater than that between the two centrals; those of the foremost row appeared to be equally separated from each other.

The *legs* are short, moderately strong, furnished with hairs and a few black spines, these last almost all on the two last pairs; each tarsus ends with two curved, toothed claws, beneath which is a scopula which extends backwards underneath the joint; their relative length is 4, 1, 2, 3.

The *falces* are neither very long nor strong, but they project a little forwards and are of ordinary form

The *maxillæ, labium*, and *sternum* present no deviation from the normal characters of the genus.

The *abdomen* is of an elongate oblong-oval form, very sparingly clothed with hairs, and of a uniform dull yellowish colour. Spiracular plates yellow and not very large. Genital aperture small, but, as usual, of characteristic form (*vide* Plate LII. fig. 23). The spinners are moderate in length and strength; those of the inferior pair are the longest and strongest.

A single example of the adult female of this species was contained in the collection of Spiders kindly made for me in Bombay by Major Julian Hobson, Staff Corps.

DRASSUS DENOTATUS, sp. n. (Plate LII. fig. 24.)

Adult female, length 3½ lines.

The general form and structure of this Spider are of the ordinary character; but the markings on the abdomen are distinct and characteristic, as also is the form of the genital aperture.

The *cephalothorax* is pale yellow-brown thinly clothed with hairs; the caput is a little more convex than usual, and it is divided behind from the thorax by two fine blackish converging lines, divided at the point of convergence by another longitudinal central one. The height of the clypeus is less than half that of the facial space, being about equal to the diameter of one of the fore central eyes.

The *eyes* are of tolerable size and in the usual position; but the curve of each row is nearly equal, making the two rows almost parallel; the hinder row is the longest, and its two central eyes are large, pearly white, and very nearly contiguous to each other, the lateral on either side being separated from them by about the diameter of one of the centrals; the fore centrals are also large, but not quite so large as the hind centrals, though forming a line of the same length, the interval between them being rather more than half of the diameter of one of them; the eyes of each lateral pair are separated from each other by an interval of about the diameter of one of them.

The *falces* are moderate in length and strength; they are prominent at their base in front, projecting forwards, and are of a dark yellow-brown colour.

The *legs* are rather short, moderately strong, furnished with hairs and spines, the latter chiefly on the two hinder pairs; their relative length is 4, 1, 2, 3, and they are of a yellow colour.

The *palpi* are similar to the legs in colour, deepening to yellow-brown on the radial and digital joints, and they are furnished with hairs and a few black spines.

The *maxillæ* and *labium* are of normal form; the former is yellow-brown, the latter considerably darker.

The *sternum* is oval, pointed behind, and similar in colour to the cephalothorax.

The *abdomen* is oval, rather truncate before, where it projects a little over the base of the cephalothorax; it is thinly clothed with hairs, and of a dull brownish black hue, speckled and marked with pale yellowish: on the upperside a dusky, elongate, tapering or wedge-shaped marking occupies the central longitudinal line of the fore half: on either side of the hinder or pointed end of this marking are two small, pale, elongate spots; and following it, towards the spinners, in a longitudinal series, are 6 or 7 transverse angular bars or chevrons of a pale dull yellow colour; and the vertex of each of these runs into the angle of the one preceding it. The dark ground-colour of the abdomen is disposed in parallel striæ towards and on the sides; and the intervals between the yellowish angular bars themselves form dark broken chevrons. On the underside are two longitudinal and rather pale yellowish lines, which converge at a little distance from the spinners; and at the extremity of these lines on either side is a curved row of three round pale yellowish spots, more distinct than the rest. The spinners are moderate in length and strength, those of the inferior pair being the longest, and their colour is similar to that of the legs. The genital aperture is large and of peculiar form (*vide* Plate LII. fig. 24).

A single adult female was found by myself at Cairo.

Drassus pugnax, sp. n. (Plate LII. fig. 25.)

Adult male, length 3½ lines.

The *cephalothorax* of this species is short, oval, rather more pointed before than in many others of the genus, but in other respects of normal form; it (as well as all the rest of the fore part of this Spider) is of a rather bright yellow-brown colour, clothed, but not at all densely, with greyish-yellow pubescence, and some prominent black bristly hairs in the ocular region; the normal grooves and indentations are not strong, but are well indicated by being of a rather deeper hue than the rest.

The *eyes* are in the ordinary position, two transverse curved rows; the front row is the most curved, the hinder one being very nearly straight; the lateral eye of each row is nearer to the opposite lateral eye of the other row than the central eyes of the one are to those of the other; the eyes of the hinder row are equidistant from each other and of about equal size; those of the front row are large, all larger than those of the hinder one, and the fore central pair much the largest of the eight; each of these latter is very nearly contiguous to the lateral of the same row on its side, and they are separated from each other by nearly about half of an eye's diameter.

The *legs* are strong, especially the femoral joints, and moderately long, their relative length being 4, 1, 2, 3; they are furnished with hairs, spines, and bristles; and each tarsus ends with two curved claws, beneath which is a claw-tuft or scopula.

The *palpi* are pretty strong, but not very long. The radial and cubital joints are short; the former is rather the shortest but strongest, and has its outer extremity produced into a long and strong apophysis; this is a little tapering at first, but has its extremity divided into two very peculiar and distinct limbs; one of these (the upper one) is strongly bent inwards and sharp-pointed, the other obtuse and straighter. The digital joint is large, of the ordinary oval form, and of a darker hue than the rest of the joint. The palpal organs are well developed but simple, having some longitudinal, parallel, dark, sinuous markings on the surface of the principal corneous lobe, and a small curved corneous process at their fore extremity; the humeral joint has three curved, black, spine-like bristles near its fore extremity on the upperside; two are near the margin, and the third a little way behind.

The *falces* are vertical and not very long nor strong; the *maxillæ*, *labium*, and *sternum* are of normal form.

The *abdomen* is oval, rather truncate before, and projecting over the base of the cephalothorax; it is of a uniform pale brownish-yellow hue, clothed sparingly with fine yellowish-grey hairs; and on the fore part of the upperside is a large bright yellow-brown patch of a shining semicorneous nature, similar in colour to the cephalothorax and other fore parts; this patch is of a curvilinear, tapering form; and along its centre is indistinctly visible an elongate tapering, and rather darker marking, the sharp point of which extends beyond its hinder and pointed extremity: also on the fore part of the upperside of the abdomen are four impressed spots or dark punctures in an oblong quadrangular figure; the foremost pair of these spots are rather obscured by the shining patch above described. The spinners are yellow-brown, rather long and strong, those of the inferior pair stronger and about one third longer than those of the superior pair. The spiracular plates are very nearly of the same colour as the rest of the abdomen, and, like it, clothed with hairs.

A single adult male of this Spider was found by myself among débris of an old wall at Cairo. It may be distinguished easily by the peculiar form of the radial apophysis, and large size of the fore central pair of eyes.

Genus MICARIA (Westr.).

MICARIA ARMATA, sp. n. (Plate LII. fig. 26.)

Adult female, length 1¾ line.

This exceedingly brilliant little Spider belongs to a group of the genus *Micaria* whose eyes are in the position of those of the genus *Gnaphosa*, and the abdomen connected with the cephalothorax by a distinct pedicle. M. Lucas has described two species of this group, in his work on Algerian Spiders, in the genus *Drassus*. Dr. L. Koch has, in his work on the Drassides, included these species as (to him) unknown species of the genus *Gnaphosa*, probably so allocating them from the strongly marked position of the eyes. I cannot, however, find any difference in the form of the maxillæ from *Micaria*; and the whole appearance, form, and brilliancy of colouring (in the present instance) connects these Spiders unmistakably with *Micaria* rather than with *Gnaphosa*.

Micaria armata may be distinguished at once by the palpi as well as the tibiæ and metatarsi of the legs of the first pair being armed with long, strong spines.

The *cephalothorax* is oval, rather narrow before, and but slightly constricted laterally at the caput; it is of a brownish-yellow colour, the caput being dark brown, the whole clothed with scaly hairs reflecting the most brilliant metallic tints of gold, violet, purple, and green.

The *eyes* are in two transverse, rather widely separated, curved rows, the curves directed towards each other; the foremost row is much the shortest, and the eyes composing it are almost, but not quite contiguous to each other; the laterals of this as well as of the hinder row are larger than the centrals; the hind centrals are oval, oblique, and further from each other than each is from the lateral of the same row on its side; the eyes of each lateral pair are as widely separated from each other as the lateral eyes of the foremost row. The height of the clypeus is equal to the space between the fore and hind central pairs of eyes.

The *legs* are long and slender; their relative length appeared to be 4, 1, 2, 3; they are of a pale yellow colour, with a strong longitudinal black stripe on the femora of the 2nd, 3rd, and 4th pairs, the lower part of those of the first pair being black: beneath the metatarsi and tibiæ of the first pair are some long, strong, prominent, divergent spines, apparently articulated to small tubercles; one pair of these are beneath the metatarsi, two pairs beneath the tibiæ, and a single one issuing from a black spot inside each of the femora; besides these spines the legs are only furnished, and that sparingly, with hairs.

The terminal tarsal claws are two in number, minute, and without any claw-tuft beneath them.

The palpi are strong, rather long, of a dull blackish colour, and on the inner side of the three last joints (cubital, radial, and digital) there are several longish strong spines pointing inwards; when the palpi and fore legs are drawn back in an attitude of defence, these spines form a sort of chevaux-de-frise over the fore part of the caput, and are very conspicuous.

The falces are rather long, strong, and a little inclined backwards towards the labium; they are of a yellow-brown colour, and furnished with strong bristly hairs.

The maxillæ are rather long, strong, slightly dilated at their extremities, inclined towards the labium, and broadly and transversely impressed across the middle.

The labium is broader at the base than at the apex, which is rounded; the colour of this part, as well as of the maxillæ, is a pale dull yellow-brown.

The sternum is elongate-oval, sharp-pointed behind, truncate in front, and of a darker colour than the maxillæ and labium.

The abdomen is joined to the cephalothorax by a distinct pedicle or short waist-like stalk; it is of an oblong-oval form, strongly constricted over the middle of the upperside, the constriction marked by a yellowish band clothed with whitish hairs; the fore half of the upperside is divided longitudinally by a broad yellowish band, the remainder, as well as the hinder half, is dark blackish brown, the whole clothed with scaly hairs reflecting similar metallic tints to those on the cephalothorax; on each side of the fore part is an ill-defined oblique stripe or patch of a yellowish colour, clothed with whitish hairs; the underside is pale yellowish, but darker near the spinners, and also clothed with iridescent hairs. The *spinners* are small, those of the inferior pair being the strongest; close above the anal tubercle is a small compact tuft of white hairs. The genital aperture is small, inconspicuous, and very simple in form.

Two immature females of this beautiful and most interesting little Spider were found at Hyères, in France, in May 1873, and kindly given me by Mr. J. T. Moggridge, who has since found four other examples (all females), one only being adult, at Mentone; these also Mr. Moggridge has kindly sent to me. The immature examples have a paler hue and a more brilliantly purple and golden tinge than the adult; the spines on the fore legs and palpi are exceedingly characteristic.

Genus PHRUROLITHUS, C. Koch.

PHRUROLITHUS GRACILIPES (Blackw.). (Plate LII. fig. 27.)

Drassus gracilipes, Bl. Ann. & Mag. Nat. Hist., Oct. 1863.

Drassus romanus, L. Koch, Die. Arachn.-Fam. der Drassiden, p. 225 (1866).

An immature male of this Spider, from near Lisbon, was described as a *Drassus* by Mr. Blackwall (*loc. cit. suprà*), and an immature female by Dr. L. Koch, three years later, from Rome, as a *Phrurolithus*.

Several immature examples were found by myself under stones among the ruins of the Baths of Caracalla in February 1865; and more recently I have received an adult example of each sex from Spain: these do not differ from the immature examples described by Mr. Blackwall and Dr. L. Koch in colours and markings and general characters; the male, however, has the upper surface of the abdomen shining and coriaceous, and the double row of long strong sessile spines beneath the tibiæ and metatarsi of the first and second pairs is very conspicuous.

The *palpi* of the male are of a deep black-brown colour, but neither very long nor strong; the radial joint is about the same length as the cubital, and has its fore extremity produced over the base of the digital joint into a longish, tapering, curved, sharp-pointed apophysis. The digital joint is large and exceeds in length the radial and cubital joints together; it is of an oblong-oval form, and its extreme point obtuse. The palpal organs are simple, consisting of a roundish lobe, from near the middle of which a corneous tapering spiny process runs backwarks and round the inner side and fore extremity.

The colour of the *cephalothorax* is deep black-brown, and in both sexes is furnished with some short iridescent hairs. The *legs* are long and slender, of a black-brown colour, getting lighter towards their extremities. The tarsi, as well as a small portion at the fore extremity of each tibia, are of a pale yellow colour; this is most marked in the female. The spines beneath the tibiæ and metatarsi have been before referred to. Each tarsus ends with two claws, springing from a small supernumerary or heel-joint; and beneath them is a very small scopula.

The abdomen of the female is black, with an oblique whitish line on each side at the fore extremity, and a transverse, slightly curved, white line or narrow bar a little way above the spinners; this white line was almost imperceptible in the adult male, but very conspicuous in the female; on the upper surface of the abdomen of this sex are a few short iridescent hairs. The form of the genital aperture, shown in the figure, is characteristic.

Genus CHEIRACANTHIUM (Koch).

CHEIRACANTHIUM DUBIUM, sp. n. (Plate LII. fig. 28.)

Adult male, length 3 lines.

This Spider is of great interest, approaching so nearly as it does to the genera *Drassus* and *Clubiona*. Were it not that the relative length of the legs differs from that of those genera and coincides with that of *Cheiracanthium* (1, 4, 2, 3, instead of 4, 1, 2, 3), I should have been inclined to describe it as a *Clubiona*.

The whole of the fore part is of a dull-orange yellow-brown colour, the falces being rather darker than the rest. The abdomen is of a flattish oval form, rather truncate at its hinder extremity; its colour is a pale straw-yellow; an elongate-oblong, central, longitudinal, dull brown marking occupies the fore half of the upperside; this is followed towards the spinners by several angular bars or chevrons (of the same colour), whose angles are obsolete, the ends of the bars only remaining; the sides are also marked with a few short irregular similarly coloured lines and spots; on either side of the longitudinal bar on the fore half are three small but conspicuous reddish-brown spots, forming a slightly curved line. The spinners are long and cylindrical; those of the inferior pair slightly curved, longest, and strongest; those of the superior pair 2-jointed.

The form of the *cephalothorax* is more elongate than in *Cheiracanthium* generally; it is oval, with the lateral constriction at the caput very slight, and the fore part moderately narrow; the normal grooves and indentations are marked by dusky converging lines.

The *eyes* are of moderate size, in two transverse curved rows, the eyes of each of which respectively are equidistant from each other; the four central eyes form a quadrangular figure, whose hinder side is rather the longest; the eyes of each lateral pair are placed obliquely but are not contiguous to each other. The clypeus appears to be about equal in height to the diameter of one of the fore central eyes.

The *legs* are moderately long and tolerably strong; their relative length is 1, 4, 2, 3; and the genual joints are longer than usual; they are furnished very sparingly with hairs and a few spines; each tarsus ends with two curved pectinated claws, beneath which is a very small claw-tuft.

The *palpi* are not very long, but tolerably strong. The cubital and radial joints are about equal in length; the latter is bent and has at its extremity on the outer side a rather prominent, slightly curved, tapering, sharp-pointed, red-brown, spine-like apophysis; and near the extremity on the inner side are two spines, one nearly upright, the other shorter but bent and directed forwards. The digital joint is dark yellow-brown, oval, pointed before, but not drawn out as in other species of this genus; it is about equal to, or perhaps a little longer than the radial joint; the normal spur from the hinder part is obsolete, represented only by a slight prominence. The palpal organs consist of a principal oval lobe broken up at its fore part into several corneous processes, among which is a strongish one, somewhat in the form of an S crook.

The *falces* are moderately long, tolerably strong, projecting and prominent towards their base in front.

The *maxillæ* are strong, of an oblong form, rather broadest at their extremities, straight but slightly inclined to the *labium*, which is half the length of the maxillæ, and of a short, oblong-oval form.

The *sternum* is of the ordinary heart-shape, with a slight eminence opposite the articulation of each pair of legs.

A single adult male of this species was found by myself near Alexandria (Egypt), in April 1864.

CHEIRACANTHIUM EQUESTRE, sp. n. (Plate LII. fig. 29.)

Adult male, length rather more than 2½ lines.

The *cephalothorax* of this species is of a yellowish colour; it is longer in proportion to its breadth than in many others of the genus, and the lateral constrictions of the caput are stronger, the caput being thus rather narrower and more drawn out; the normal indentations are not very strong, but are well indicated by converging dusky radii.

The *eyes* are rather larger than usual, but in the ordinary position, and seated on black spots, and form two transverse curved rows, occupying the entire width of the fore part of the caput; the curves are directed away from each other, that of the hinder row being the strongest. The clypeus is almost obsolete, the edge of the fore central eyes almost touching the fore margin of the caput. The eyes of the hind central pair are rather nearer to each other than each is to the hind lateral on its side; and a similar relative position is observable in regard to the eyes of the front row. The interval between each fore central eye and the hind central nearest to it is less than the diameter of the latter; the fore centrals are largest of the eight; the eyes of each lateral pair are seated obliquely on a tubercle very near but not contiguous to each other.

The *legs* are rather long and moderately strong; their relative length is 1, 4, 2, 3; they are of a slightly lighter-coloured yellow than the cephalothorax, furnished sparingly with hairs and a very few spines; each tarsus ends with two claws, beneath which is a compact blackish claw-tuft.

The *palpi* are not very long, but moderately strong. The radial joint is scarcely double the length of the cubital; it is cylindrical, and has its outer fore extremity prolonged into a tolerably strong, tapering, sharp-pointed, bicurved apophysis, of a dark reddish-brown colour, equal to half the joint in length; the inner side of the fore extremity also has a small prominence or apophysis. The digital joint is rather large, and equal in length to the radial and cubital joints together; it is of a dark blackish yellow-brown colour, prominent at the middle of the outer side, and hairy; the fore part is produced and tapering, like that of nearly all the known species of *Cheiracanthium*, though not so elongated as in some others. The normal spur directed backwards from the outer side of the hinder extremity is strongly bent downwards and directed outwards; it contracts rather abruptly towards its extremity, terminating in a fine, sharp-pointed, red-brown, corneous-looking spine. The palpal organs are of the ordinary form and simple structure, and are almost encircled by a slender, tapering, sharp-pointed spine, which issues from near the middle of their outer side.

The *falces* are neither very long nor strong; they are straight, projecting, not divergent, and of a yellow-brown colour. The maxillæ and labium are of normal form and structure and rather lighter-coloured than the falces.

The *sternum* is pale yellow and very glossy.

The *abdomen* is oval, considerably convex before, and rather sloping down towards the hinder part; its fore part projects a good deal over the base of the cephalothorax; its upper surface is yellowish white, as if covered with confluent cretaceous-looking spots. On the fore half of the upperside is the ordinary elongate macula of a dull dark mouse-coloured brown hue; the sides of this macula are slightly angulate; and there is a prominent point or spot of the same hue about the middle of each side. The sides and underside of the abdomen are similar to the upperside; the sides, however, are tinged forwards with reddish yellow-brown, and the underside has a strongish, longitudinal, central band of a mouse-coloured brown.

The spinners are rather short, those of the inferior pair much the strongest, those of the superior pair exceeding them in length by the very short second joint of the former.

An adult female differed in being rather larger, paler-coloured, and the abdomen less strongly marked. The falces also appeared to be less projecting, and the legs are shorter and stronger. The genital aperture is small, of a somewhat semilunar form, margined with red-brown.

An adult example of each sex was found by myself on low plants near Cairo, in January 1864.

CHEIRACANTHIUM INORNATUM, sp. n. (Plate LII. fig. 30.)

Adult male, length 3½ lines.

The *cephalothorax*, *legs*, *palpi*, and *sternum* of this Spider are yellow, the *falces* deep red-brown, the maxillæ and labium being of a lighter and duller red-brown hue. In general form and aspect it is of the ordinary type. The cephalothorax is covered pretty densely with fine, pale, silky hairs; it is short, broad, slightly constricted laterally at the caput, whose fore margin is squarely truncated; and the ocular region is somewhat suffused with reddish brown.

The *eyes* are small, in the ordinary position, and occupy nearly the whole width of the fore part of the caput. The clypeus is scarcely equal to the diameter of one of the fore central eyes. The eyes of the front row form a straight line, shorter than the hinder row, which is curved, the curve directed backwards. The eyes of the hind central pair are rather nearer to each other than each is to the lateral of the same row on its side; and the same relative position is observable with respect to the eyes of the front row. The fore centrals are the largest of the eight; they form a line shorter than the hind centrals, and each is separated from the hind central opposite to it by an interval about equal to the diameter of the latter; those of each lateral pair are seated on a tubercle contiguous to each other and in a slightly oblique line.

The *legs* are long and slender; their relative length is 1, 4, 2, 3; they are furnished with hairs, and a few not very long nor strong dark brown spines. Each tarsus ends with two claws and a compact blackish claw-tuft.

The *palpi* are not very long nor strong. The cubital joint is short; and the radial is rather more than double its length, cylindrical, and its outer extremity terminates in a small, slightly tapering, straight, red-brown apophysis, whose point is a little bent and somewhat unguiform. The radial joint is furnished with long prominent hairs, principally on the underside. The digital joint is about equal in length to the radial; it is of ordinary form, hairy, and suffused with brown, and considerably prominent on the outer side. The normal spur issuing backwards from the hinder extremity on the outer side is red-brown, a little bent, sharp-pointed, tapering, and thorn-like; its length is moderate, less than half the length of the joint, and it points outwards. The palpal organs are of the usual form, and almost encircled by a tapering, sharp-pointed spine, which issues from near the middle of their outer side.

The *falces* are moderately long and strong, but less so than in many others of this genus; they project forwards, but are straight and do not diverge laterally from each other.

The *abdomen* is not very large; it is oval, and projects a little over the base of the cephalothorax; it is clothed with pale silky hairs, and there are some darker prominent ones on the fore part of the upper side. The spinners are yellow and rather short; the second joint of the superior pair is very short; the inferior pair are much the strongest.

The female is a little larger than the male, but similar in colour and other general characters. The genital aperture is short, transverse oval, broken into at the middle of its fore side, and having a strongish yellow-brown, corneous-looking margin. The legs of this sex are also shorter and proportionally stronger than those of the male.

An adult example of each sex were found in the collection received from Bombay from Major Julian Hobson.

CHEIRACANTHIUM ISIACUM, sp. n. (Plate LII. fig. 31.)

Adult male, length 3¾ lines; adult female 4 lines.

In general form and characters this Spider is very like the European species *C. carnifex*.

The *cephalothorax* is not very convex above; it is of a yellow colour, clothed with short, fine, pale hairs. The ocular region is strongly suffused with blackish brown; and from each of the hind central pair of eyes an indistinct tapering stripe of the same runs backwards towards the junctional point of the thoracic segments; the normal grooves and indentations are well marked by converging dusky stripes.

The *eyes* are on black spots in the usual position; they are rather small, and do not differ greatly in size. The height of the clypeus is no more than half the diameter of one of the fore central pair of eyes, which are largest of the eight; those of each row severally appeared to be as nearly as possible equidistant from each other, the four central eyes forming very nearly a square, the transverse, however, being rather longer than the longitudinal diameter; those of each lateral pair are slightly obliquely placed on a tubercle, but not quite contiguous to each other.

The *legs* are long, moderately strong, their relative length being 1, 4, 2, 3; their colour is yellow, rather paler than the cephalothorax, furnished with hairs of different length and strength, and more than the ordinary number of spines; the most characteristic of these (in the male) are a single longitudinal row of about 12 or 13, not very long, but tolerably strong, beneath the metatarsi of the fourth pair, several others with the last one of this row forming a luteous yellow colour, with a slight indication of the ordinary elongate macula on the fore half of the upperside. The spinners are not large; those of the superior pair are two-jointed, the second joint being small and shorter than the first. The adult female resembles the male in colours and general characters; the genital aperture is small and of a narrow transverse kidney-shape.

The colour of the abdomen in this and many other very similarly coloured species can hardly be reliable as above described, the specimens having been some time preserved in spirits of wine; in our indigenous British species the colours of the abdomen are in life more or less green, while the spirit discharges this in a short time, leaving it only of a dull yellow; and this is very probably the case in the present and many other exotic species of this same genus.

An adult male and female of this remarkable and easily distinguished Spider were contained in the Bombay collection received from Major Julian Hobson; and the collections received from Ceylon from Mr. G. H. K. Thwaites also contained many adult examples of both sexes.

CHEIRACANTHIUM VORAX, sp. n. (Plate LII. fig. 33.)

Adult male, length 3¾ lines; adult female 5 lines.

The whole of the fore part of this species (except the falces, which are of a deep rich reddish brown, the ocular region, the maxillæ, and labium, which are suffused with reddish brown) is yellow; the cephalothorax is (looked at from above) short and broad, round behind, constricted laterally at the caput, broad and truncate at the eyes; the normal lateral grooves and indentations are indicated by dusky yellow converging streaks; the profile of the cephalothorax is curved, sloping quickly from the middle of the caput to the frontal margin or lower edge of the clypeus; the hinder slope is gradual and also curved; it is pretty fairly clothed with fine, rather short, pale hairs. The clypeus is very low, being less in height than the diameter of one of the fore central pair of eyes.

The *eyes* are in two almost equally curved transverse rows of very nearly equal length; the front row is the straightest, and the curves are directed away from each other; those of the fore central pair are the largest of the eight, and are rather nearer together than each is to the fore lateral eye nearest to it; and this is also the case in regard to the eyes of the hind central pair; these with the fore centrals form very nearly a square, whose transverse diameter, however, is a little longer than its longitudinal; those of each lateral pair are seated slightly obliquely on a small tubercle, and are very near to each other, but not contiguous.

The *legs* are long, moderately strong; their relative length is 1, 4, 2, 3; they are furnished with fine hairs and a very few spines, those on the tibiæ and metatarsi of the fourth pair being the most numerous and arranged somewhat in rings; the tarsi terminate with the usual two claws, beneath which is a compact scopula of black hairs.

The *palpi* are rather slender and not very long; the radial is full lothorax tinged with orange-brown (the ocular region being brown) and clothed with short fine pale hairs; a rather indistinct, narrow, elongate, wedge-shaped, brown stripe runs backwards from between the hind central eyes, and the normal grooves and indentations are marked by dusky converging stripes. In form the cephalothorax is short, round behind, constricted laterally at the caput, truncate before, but not so broad at this part as in some other species; the hinder slope is gradual; and the whole profile describes a pretty uniform curve, of which the occiput is the middle and the highest part.

The *eyes* are of moderate size, those of the fore central pair being the largest; their position is ordinary, the two rows occupying very nearly the whole width of the fore part of the caput; the clypeus is very low, less than the diameter of one of the fore central eyes. The eyes of each row, severally, appeared to be as nearly as possible equidistant from each other; the four central eyes form a square; those of each lateral pair are contiguous to each other and seated obliquely on a tubercle; all are on black spots, forming a narrow rim to each.

The *legs* are long and rather slender; their relative length is 1, 4, 2, 3; and they are furnished with hairs and spines: one of the latter is noticeable; it is beneath the fore extremity of the metatarsi of the third and fourth (or two hinder) pairs, stronger than the rest, but not so long as some of them, curved and black. Each tarsus ends with two curved pectinated claws, beneath which is a compact scopula.

The *palpi* are short, but appear to be longer, owing to the great size and length of the digital joint and palpal organs. The cubital joint is very short, the radial being somewhat longer; this latter has its outer extremity produced into a small, black, rather bluntish-pointed, very slightly curved apophysis, and is furnished with prominent bristly hairs both on the upper and under side; there is also a small prominence underneath the extremity of the radial joint, rather on the inner side, and a small spur-like spine from near the fore extremity of the upperside. The digital joint is almost as long as the whole of the rest of the palpus; looked at from above it is of a long, narrow, somewhat sinuous form; the portion beyond the palpal organs, often of considerable length in some species, is in the present species short; the normal spur at the hinder extremity is short, strong, pointed, and directed outwards close over the radial apophysis. The palpal organs have a sort of oval nucleus (with a corneous margin on the outer side) beneath the middle of the digital joint, with a considerable and somewhat membranous extension on all sides projecting far beyond the limits of the joint; this membranous portion is bounded by an extremely long, slender, sinuous, black, filiform spine, which commences on the inner side and appears to terminate in a coil near the centre of the palpal organs.

The *falces* are tolerably strong, rather long; they project forwards a little, and are slightly divergent; their colour is a deep, rich, blackish red-brown, that of the maxillæ and labium being red-brown.

The *abdomen* is of an elongate-oval form, highest before, where it projects a little over the base of the cephalothorax; it is of a dull luteous yellow colour, with a slight indication of the ordinary elongate macula on the fore half of the upperside. The spinners are not large; those of the superior pair are two-jointed, the second joint being small and shorter than the first. The adult female resembles the male in colours and general characters; the genital aperture is small and of a narrow transverse kidney-shape.

The colour of the abdomen in this and many other very similarly coloured species can hardly be reliable as above described, the specimens having been some time preserved in spirits of wine; in our indigenous British species the colours of the abdomen are in life more or less green, while the spirit discharges this in a short time, leaving it only of a dull yellow; and this is very probably the case in the present and many other exotic species of this same genus.

An adult male and female of this remarkable and easily distinguished Spider were contained in the Bombay collection received from Major Julian Hobson; and the collections received from Ceylon from Mr. G. H. K. Thwaites also contained many adult examples of both sexes.

Cheiracanthium vorax, sp. n. (Plate LII. fig. 33.)

Adult male, length 3¾ lines; adult female 5 lines.

The whole of the fore part of this species (except the falces, which are of a deep rich reddish brown, the ocular region, the maxillæ, and labium, which are suffused with reddish brown) is yellow; the cephalothorax is (looked at from above) short and broad, round behind, constricted laterally at the caput, broad and truncate at the eyes; the normal lateral grooves and indentations are indicated by dusky yellow converging streaks; the profile of the cephalothorax is curved, sloping quickly from the middle of the caput to the frontal margin or lower edge of the clypeus; the hinder slope is gradual and also curved; it is pretty fairly clothed with fine, rather short, pale hairs. The clypeus is very low, being less in height than the diameter of one of the fore central pair of eyes.

The *eyes* are in two almost equally curved transverse rows of very nearly equal length; the front row is the straightest, and the curves are directed away from each other; those of the fore central pair are the largest of the eight, and are rather nearer together than each is to the fore lateral eye nearest to it; and this is also the case in regard to the eyes of the hind central pair; these with the fore centrals form very nearly a square, whose transverse diameter, however, is a little longer than its longitudinal; those of each lateral pair are seated slightly obliquely on a small tubercle, and are very near to each other, but not contiguous.

The *legs* are long, moderately strong; their relative length is 1, 4, 2, 3; they are furnished with fine hairs and a very few spines, those on the tibial and metatarsi of the fourth pair being the most numerous and arranged somewhat in rings; the tarsi terminate with the usual two claws, beneath which is a compact scopula of black hairs.

The *palpi* are rather slender and not very long; the radial is full (if not rather more than) double the length of the cubital joint, which is a little bent. The radial is furnished with long erect fine hairs; its outer extremity has a small deep-red-brown apophysis, which is rather curved and terminates with a somewhat hooked point, and a small tuberculiform prominence beneath its extremity near the inner side. The digital joint is of ordinary form, prominent at the middle of its outer margin, roundish behind, produced in front, though not there so cylindric in its form as in *C. indicum* (*vide infrà*); its length is about the same as that of the radial joint; and from its hinder part there runs obliquely outwards a moderately long, slender, red-brown, thorn-like apophysis, extending backwards to about half the length of the cubital joint. The palpal organs occupy the underside of the hinder half of the digital joint; they are very similar in general structure to many others of the genus, consisting of a rather flattened oval corneous lobe, with a curved elongate pale projection at their fore part, and a rather slender spine which issues from the fore extremity on the outer side and curves backwards, terminating in a sharp filiform point on their inner margin.

The *falces* are long, three fourths as long as the cephalothorax, strong, divergent, and nearly vertical; their profile line is slightly and equally curved; and their fore sides are furnished with a few not very strong bristly hairs. The form of the maxillæ and labium is normal; the latter, however, is not apparently hollowed at its apex.

The *abdomen* is of a dull, pale, luteous yellow colour, clothed with fine hairs of various lengths, some on the upperside being very slender, long, and erect; the most convex part is at the fore side, where it projects over the base of the cephalothorax; thence it slopes gradually in a slightly curving line to the spinners; these are moderately long; those of the superior pair are less strong than the inferior ones, and two-jointed, the tapering second joint constituting their excess in length over the inferior spinners.

The adult female is larger than the male; and its cephalothorax is strongly suffused with brownish red; the legs are also shorter and stouter; the genital aperture is simple in form, being of a somewhat transverse kidney-shape.

An adult example of each sex was received from Major Julian Hobson, by whom they were found, and kindly forwarded to me from Bombay.

CHEIRACANTHIUM INDICUM, sp. n. (Plate LII. fig. 34.)

Adult male, length rather more than 3 lines.

The *cephalothorax* of this species, looked at from above, is short, round behind, constricted laterally on each side at the caput, truncated squarely at the fore extremity, and the normal grooves and indentations fairly marked; looked at in profile the hinder slope is short and abrupt, and the profile line from its upper part is a gradual (but sloping) curve to the clypeus, which is low and rather less than half the height of the facial space. The colour of the cephalothorax, as well as of all the rest of the fore part of the Spider, is a clear dull orange-yellow.

The *eyes* are all on black spots, in two transverse rows, slightly and equally curved away from each other, and occupying the entire width of the caput; they are of moderate size and not greatly unequal, those of the fore central pair being the largest; these are seated on slight tubercles, and separated from each other by an eye's diameter, being also nearer together than each is to the fore lateral on its side; those of the hind central pair are separated by very nearly two eyes' diameters; they form a line a little longer than that formed by the fore central pair, and are rather nearer together than each is to the nearest hind lateral eye; the eyes of each lateral pair are seated obliquely on a slight tubercle and are nearly contiguous to each other.

The *legs* are very long, slender, sparingly furnished with hairs, and armed with a few long sessile spines; but most of these had been broken off in the only example examined; their relative length is 1, 4, 2, 3, those of the first pair being considerably the longest; each tarsus ends with two curved claws, beneath which is a small compact tuft of hairs or scopula.

The *palpi* are moderately long, but slender; the radial joint is cylindrical, and nearly of equal size throughout; if any thing, it rather exceeds in length double that of the cubital joint; and its fore extremity on the outer side is produced into a small, tapering, bluntish-pointed, curved apophysis. The digital joint is long and narrow, about equal in length to the radial joint; it is oval behind, constricted over the middle, whence it continues to the extremity in a nearly cylindrical form, being slightly enlarged towards the end, and the point obtusely subconical; the hinder extremity is produced backwards into a sharp-pointed, somewhat corneous apophysis peculiar to all males of this genus; this apophysis is rather sharply bent at its base, and its length is about one fourth of that of the digital joint; the fore half of the digital joint is pretty thickly clothed with shortish hairs. The palpal organs are simple, but rather prominent, and occupy the hinder half of the underside of the digital joint; these organs consist chiefly of a nearly circular corneous lobe, with a pale prominence at the fore extremity, and a black, tapering, sharp-pointed spine which, issuing from their outer side, curves round their hinder extremity and terminates in close contact with their inner side.

The *falces* are subconical, straight, but projecting, moderately long, not very strong, a little prominent near their base in front, and furnished with bristly hairs near their extremities, chiefly on the inner sides and about the insertion of the fangs.

The *maxillæ* are normal; the *labium*, oblong, emarginate at its apex, and more than half the length of the maxillæ.

The *abdomen* is elongate-oval, more convex at the fore extremity, where it projects over the base of the cephalothorax, than behind, and falling off gradually (when looked at in profile) to the spinners; it is of a pale luteous yellow colour, marked above and on the sides with tracings of small whitish cretaceous atoms; the spinners of the superior pair are tapering, 2-jointed, slenderer than the inferior pair, but double their length.

A single adult male was received from Bombay, from Major Julian Hobson, among many other rare and new Spiders.

Genus CLUBIONA, Latr.

CLUBIONA FILICATA, sp. n. (Plate LII. fig. 35.)

Adult male, length 3½ lines.

This Spider is very like *Clubiona robusta* (L. Koch) (Swan River, Australia) in general form, colours, and markings, but may easily be distinguished in both sexes by well-marked differences in the form of the sexual organs; its colours and markings also strongly remind one of *C. comta* (C. Koch) of Europe.

The *cephalothorax* is of ordinary form; it is of a brownish orange-yellow colour, deepening towards the eyes, and clothed thinly with pale hairs, among which are a few erect slender dark ones; the lateral constrictions at the caput (which is short and broad) are slight; the normal grooves and indentations are marked by dusky converging lines.

The *eyes* are of moderate size, in the usual two transverse curved rows, the front row nearly straight and considerably the shortest; the eyes of this row are about equidistant from each other; they are placed very near, about half of one of the central eye's diameters, from the lower margin of the clypeus; the interval, however, between those of the central pair of this row, which are the largest of the eight, is perhaps rather greater than that which separates each from the fore lateral on its side; the eyes of the hinder row are more unequally separated, those of the central pair being perceptibly further from each other than each is from the hind lateral on its side; each fore central eye is separated from the hind central nearest to it by nearly the diameter of the latter; those of each lateral pair, which are the smallest of the eight, are placed very obliquely, and are divided by an interval about equal to that between the fore and hind central eyes.

The *legs* are yellow, moderately long, and tolerably strong; their relative length is 4, 1, 2, 3, though the difference between those of the first and second pairs is very slight; they are furnished with hairs and spines; and beneath the two terminal tarsal claws is a compact claw-tuft.

The *palpi* are similar in colour to the legs, rather short, and not very strong. The radial is of the same length as the cubital joint, but rather less strong; it has near the outer side of its fore extremity a small, dark, flattish, somewhat wedge-shaped apophysis, being, however, but little more than a prominent sharp point; the digital joint is of moderate size, oval, and equal in length to the radial and cubital together. The palpal organs are well developed, but simple, consisting of a large, pale yellowish oval lobe encircled by a broadish, somewhat omega-shaped, yellow-brown band, and with one or two small corneous prominences, as well as a small, fine, and not very long, coiled, filiform, black spine at their extremity.

The *falces* are moderately long, strong, slightly projecting, prominent at their base in front, of a deep yellow-brown colour, and furnished with prominent bristles before.

The *maxillæ* are of the same colour as the falces, straight, but much broader at their extremity than at the insertion of the palpi.

The *labium* is of an oblong-oval form, truncate at the apex, slightly more than half the length of the maxillæ, which it resembles in colour.

Sternum oval, truncate before, pointed behind, and similar to the legs in colour.

Abdomen elongate-oval, slightly hollow—truncate before, pointed behind, projecting over the base of the cephalothorax, of a pale yellow colour, clothed thinly with pale golden hairs, among which are a few erect dark ones; the central longitudinal normal elongate-oblong tapering marking on the fore half of the upperside is of a deep blackish red-brown colour; on each side of this are two blotches of the same colour, prolonged into oblique lateral lines; and it is followed towards the spinners by several angular bars or chevrons, whose terminations are dilated into blotches, the first being also produced into lateral lines. The spinners are moderately long, not very strong; those of the superior pair are less strong than those of the inferior, but longer by a short second joint.

The female differs from the male only in being slightly larger; the form of the genital aperture is characteristic.

An adult example of each sex was found in Major Julian Hobson's Bombay collection. It is a very interesting species, being so nearly connected with, but yet quite different from, both the European and Australian forms.

CLUBIONA DRASSODES, sp. n. (Plate LII. fig. 36.)

Adult female, length 5 lines.

Except in being larger, and differing in the form of the genital aperture, this Spider might well have been taken for the female of the foregoing species, *C. filicata*; the red-brown pattern on the abdomen is more regular, and forms a well-defined recurved peculiar pattern along the middle of the hinder half of the upper surface; the spinners are shorter and the sternum narrower, the maxillæ and labium darker, and the falces rather more projecting forwards; the eyes of the hinder row are more nearly equally divided, the difference between the interval which separates those of the central pair and each of them and the lateral eye nearest to it being very slight; the form of the genital aperture is very simple, but quite different from that of *C. filicata*; this difference may be seen at once by the accompanying figures, engraved from drawings made by Dr. Ludwig Koch.

A single adult female example was received in Major Julian Hobson's Bombay collection.

Genus AGRŒCA, Westr.

AGRŒCA PULCHERRIMA, sp. n. (Plate LII. fig. 37.)

Adult male, length slightly over 3 lines.

This is a very pretty but simply coloured Spider. The *cephalo-*

thorax is rather short-oval, constricted laterally at the caput, the fore part of which is rather narrow; its colour is dark brown, a broad central band comprising nearly the whole of the caput, but gradually narrowing to the hinder part of the thoracic portion, as well as a broad band on each side above the lateral margins, being thickly clothed with short white hairs. Looked at in profile, the hinder slope of the cephalothorax is abrupt, and from its summit there is a gradual and even slope to the eyes.

The *eyes* are of moderate size, in two almost equally curved transverse rows (the front row being a little the shortest), the curves directed away from each other, and forming a broadish transverse oval area; the eyes of the hind central pair are rather further from each other than each is from the hind lateral on its side, being separated by about an eye's diameter; and the same relative position holds good in regard to the eyes of the front row; those of each lateral pair are placed very slightly obliquely, but are not quite contiguous to each other; the four central eyes form a quadrangular figure, whose length is greater than its breadth.

The *legs* are moderately long and strong, furnished with hairs and spines; their relative length is 4, 1, 3, 2, the difference between 1 and 3 being very slight indeed; the colour of the first and second pairs is yellow, that of the third and fourth pairs is deep brown, sparingly banded with dull yellowish, the bands clothed with short white hairs; the tarsi are dull yellowish brown, and each terminates, as far as could be ascertained, with two claws, beneath which is a black scopula.

The *palpi* are not very long, moderately strong, and of a yellow colour, similar to that of the fore legs. The cubital and radial joints are short but of equal length; the latter is the strongest, and has a narrow, angular prominence on its underside, the upper side being furnished with bristles, hairs, and spines; the digital joint is large, oval, with its fore extremity produced into a rather fine point. The palpal organs are simple, consisting of a large roundish lobe, marked on its surface with sinuous dark lines, and produced in a tapering form at its fore extremity, where they terminate in a spiny-looking reddish-brown point immediately beneath the extremity of the digital joint.

The *falces* are moderately long, not very strong, nearly vertical, and of a dark yellow-brown colour.

The *maxillæ* are short and oblong in form, of a yellow-brown colour, and pale yellowish at the extremities.

The *labium* is very short, rounded at its apex, which is of a pale yellowish hue, the rest being darker.

The *sternum* is oval heart-shaped, of a deep yellow-brown colour, sparingly clothed with short whitish hairs.

The *abdomen* is oval, narrower before than towards its hinder part; the upper part and sides are dull black; on either side of the upper part is a bold longitudinal, somewhat zigzag, broken pattern along its whole length, densely clothed with short white hairs; the lower portion of the sides is also clothed with white hairs; the underside is bright reddish yellow-brown, sparingly clothed with short white hairs; the fore part of the underside is covered with a continuous kind of red-brown shield, comprising the two spiracular plates. The spinners are short, blackish, tipped with pale yellowish; those of the inferior are rather longer and much stronger than those of the superior pair.

A single adult male was received several years ago from the Andes of South America.

AGRŒCA WALSINGHAMI, sp. n.

Adult male, length rather more than 3 lines.

This species is very nearly allied to the foregoing, which it resembles in size, form, and general structure; the colour and markings, however, of the foregoing will distinguish it at once from the present Spider.

The *cephalothorax* is deep black-brown, uniformly clothed with short whitish hairs; the legs of the first two pairs have the femora deep black-brown, thinly clothed with short white hairs, the rest dull yellowish, tinged with olive; the femora of the third and fourth pairs are the same in colour and clothing as those of the first and second; but the remainder is of a dark red-brown, the metatarsi of the fourth pair having a few white hairs dispersed over them; all the legs are armed with a few fine spines; and the tarsi have two terminal claws, beneath which is a claw-tuft; the coxal and exinguinal joints of all the legs are deep blackish brown, as also is the sternum.

The *falces* are stronger than in *A. pulcherrima*, and are of a deep blackish red-brown colour.

The *maxillæ* and *labium* are dark red-brown, tipped with pale yellowish.

The *palpi* are short, of a dark yellowish-brown colour, the humeral joint the darkest; the radial is stronger and slightly longer than the cubital, of a similar form beneath, as in the foregoing species, but the angularly prominent portion is rather more marked; the digital joint is large, long, and like that of the foregoing in form; the palpal organs are also very similar, but there are no sinuous lines apparent on the surface of the main lobe, and the part produced forwards appears to terminate more obtusely, without the spiny point visible in that species.

The *abdomen* is of an oblong-oval form; the greater part of the upperside is covered with a well-defined, oval, coriaceous distinct epidermis of a reddish yellow-brown colour; the fore part is darker than the rest, and is clothed thinly with short white hairs, the rest with short bright yellow-red ones; the sides and hinder part are of a foxy red, clothed with red hairs, and some white ones between the sides and underside; the underside is dark yellowish brown, clothed thinly with short pale whitish hairs. A coriaceous covering of a deep red-brown colour beneath the fore part, similar to that in the foregoing species, comprises the spiracular plates; the spinners are very short, scarcely perceptible without difficulty.

A single adult male was contained in a small collection of Spiders kindly collected for me in the Oregon territory by Lord Walsingham, with whose name I have much pleasure in connecting this pretty and interesting species.

LIST OF SPECIES.

Gnaphosa harpax, Bombay, p. 371, Plate LI. fig. 1.
—— *procera*, Egypt, p. 373, Plate LI. fig. 2.
—— *marginata*, Egypt, p. 374, Plate LI. fig. 3.
—— *venatrix*, Egypt, p. 375, Plate LI. fig. 4.
—— *corcyræa*, Corfu, p. 376, Plate LI. fig. 5.
Prosthesima tristicula, Egypt, p. 377, Plate LI. fig. 6.
—— *lugubris*, Ischl, p. 378, Plate LI. fig. 7.
—— *curina*, Egypt, p. 379.
—— *nilicola*, Egypt, p. 380, Plate LI. fig. 8.
—— *mollis*, Egypt, p. 381, Plate LI. fig. 9.
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Drassus nigrofemoratus, Italy, p. 385, Plate LI. fig. 12.
—— *bulbifer*, continent of Europe, p. 386, Plate LI. fig. 13.
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—— *ensiger*, Smyrna, p. 389, Plate LI. fig. 14.
—— *hebes*, Mentone (France), p. 390, Plate LI. fig. 15.
—— *macilentus*, Bombay, p. 392, Plate LI. fig. 16.
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—— *alexandrinus*, Egypt, p. 393, Plate LI. fig. 18.
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—— *astrologus*, Bombay, p. 395, Plate LII. fig. 20.
—— *luridus*, Bombay, p. 396, Plate LII. fig. 21.
—— *vulpinus*, Egypt, p. 397, Plate LII. fig. 22.
—— *ferrugineus*, Bombay, p. 398, Plate LII. fig. 23.
—— *denotatus*, Egypt, p. 398, Plate LII. fig. 24.
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Micaria armata, Hyères and Mentone, p. 401, Plate LII. fig. 26.
Phrurolithus gracilipes (Bl.), Rome and Spain, p. 402, Plate LII. fig. 27.
Cheiracanthium dubium, Egypt, p. 403, Plate LII. fig. 28.
—— *equestre*, Egypt, p. 404, Plate LII. fig. 29.
—— *inornatum*, Bombay, p. 406, Plate LII. fig. 30.
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—— *insigne*, Bombay and Ceylon, p. 408, Plate LII. fig. 32.
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—— *indicum*, Bombay, p. 411, Plate LII. fig. 34.
Clubiona filicata, Bombay, p. 413, Plate LII. fig. 35.
—— *drassodes*, Bombay, p. 414, Plate LII. fig. 36.
Agræca pulcherrima, Andes (S. Amer.), p. 414, Plate LII. fig. 37.
—— *walsinghami*, Oregon, p. 416.

EXPLANATION OF THE PLATES.

PLATE LI.

Fig. 1. *Gnaphosa harpax* ♂.
a, radial and digital joints of palpus, showing palpal organs; *b*, radial joint, showing peculiarity of form.

2. *Gnaphosa procera* ♂ ♀.
a, radial and digital joints of palpus, showing palpal organs of male; *b*, entire palpus in profile; *c*, genital aperture of female.

3. *Gnaphosa marginata* ♀.
Genital aperture.

4. *Gnaphosa venatrix* ♂.
a, radial and digital joint of palpus, showing palpal organs; *b*, portion of radial joint, showing form of external terminal apophysis.

Fig. 5. *Gnaphosa corcyræa* ♂.
a, radial and digital joints of palpus, showing palpal organs; b, radial joint, showing form of apophysis.
6. *Prosthesima tristicula* ♂.
a, radial and digital joints of palpus, showing palpal organs; b, radial joint, showing form of apophysis; c, maxillæ and labium.
7. *Prosthesima lugubris* ♀.
Genital aperture.
8. *Prosthesima nilicola* ♂.
Palpus in profile.
9. *Prosthesima mollis* ♀.
Genital aperture.
10. *Prosthesima cingara* ♀.
Genital aperture.
11. *Prosthesima pallida* ♂ ♀.
a, radial and digital joints of palpus, showing palpal organs of male; b, genital aperture of female.
12. *Drassus nigrofemoratus* ♂.
a, radial and digital joints, showing palpal organs; b, palpus in profile.
13. *Drassus bulbifer* ♂.
a, palpus from outer side, somewhat in profile; b, humeral joint of palpus; c, aperture leading to the spermatic vessels, corresponding to the genital aperture in female Spiders.
14. *Drassus ensiger* ♂ ♀.
a, radial and digital joints of palpus of male, showing palpal organs; b, palpus in profile, from outer side; c, genital aperture of female.
15. *Drassus hebes* ♂.
Portion of palpus from outer side in front, showing form of radial apophysis.
16. *Drassus macilentus* ♀.
Genital aperture.
17. *Drassus campestratus* ♂.
a, radial and digital joints of palpus, showing palpal organs; b, radial joint from above and behind, showing form of apophysis.
18. *Drassus alexandrinus* ♂.
a, radial and digital joints of palpus, showing palpal organs; b, palpus in profile.

PLATE LII.

19. *Drassus ægyptius* ♂ ♀.
a, radial and digital joints of palpus, showing palpal organs of male; b, genital aperture of female.
20. *Drassus astrologus* ♀.
Genital aperture.
21. *Drassus luridus* ♂ ♀.
a, radial and digital joints of palpus of male, showing palpal organs; b, radial joint, showing form of apophysis; c, genital aperture of female.
22. *Drassus vulpinus* ♀.
Genital aperture.
23. *Drassus ferrugineus* ♀.
Genital aperture.
24. *Drassus denotatus* ♀.
Genital aperture.
25. *Drassus pugnax* ♂.
a, radial and digital joints of palpus, showing palpal organs; b, radial joint, showing form of apophysis.
26. *Micaria armata* ♀.
Fore part of abdomen from beneath, showing genital aperture and pedicle connecting abdomen with cephalothorax.

Fig. 27. *Phrurolithus romanus* ♂ ♀.
a, radial and digital joints of palpus of male, showing palpal organs; b, radial joint, showing form of apophysis; c, genital aperture of female.
28. *Cheiracanthium dubium* ♂.
a, radial and digital joints of palpus, showing palpal organs; b, palpus in profile.
29. *Cheiracanthium equestre* ♂ ♀.
a, radial and digital joints of palpus of male, showing palpal organs; b, palpus, in profile; c, genital aperture of female.
30. *Cheiracanthium inornatum* ♂ ♀.
a, radial and digital joints of palpus of male, showing palpal organs; b, palpus, in profile; c, genital aperture of female.
31. *Cheiracanthium isiacum* ♂ ♀.
a, palpus of male, in profile; b, genital aperture of female.
32. *Cheiracanthium insigne* ♂ ♀.
a, palpus of male, in profile; b, genital aperture of female.
33. *Cheiracanthium vorax* ♂ ♀.
a, radial and digital joints of palpus of male, showing palpal organs; b, genital aperture of female.
34. *Cheiracanthium indicum* ♂.
Palpus, in profile.
35. *Clubiona filicata* ♂ ♀.
a, radial and digital joints of palpus of male, showing palpal organs; b, radial joint, showing form of apophysis; c, genital aperture of female.
36. *Clubiona drassodes* ♀.
Genital aperture.
37. *Agrœca pulcherrima* ♂.
a, radial and digital joints, showing form of palpal organs; b, radial joint, showing form on outer side; c, upperside of cephalothorax and abdomen, showing pattern.

June 16, 1874.

Dr. A. Günther, F.R.S., V.P., in the Chair.

Mr. Sclater read an extract from a letter addressed to him by Dr. A. B. Meyer, in which it was stated that ***Rectes bennetti***, described by Mr. Sclater, P. Z. S. 1873, p. 692, from Signor d'Albertis's collection, was the same as ***R. nigrescens***, Schlegel (Ned. Tydsch. iv. p. 46), and that ***Campephaga aurulenta*** (ibid. p. 692, pl. liv.) was identical with ***Campephaga sloetii***, Schlegel (***l. s. c.*** iii. p. 253. Mr. Sclater pointed out that the former identification could hardly be correct, so far as could be ascertained from Schlegel's description, ***R. bennetti*** being of a nearly uniform brown, with rufous outer margins to the primaries and pale cinnamomeous under wing-coverts and inner margins of the wing-feathers, whereas ***R. nigrescens*** was described as "***d'un noir peu profond.***" But as regards the ***Campephaga***, Mr. Sclater had unfortunately overlooked Dr. Schlegel's description, and had no doubt of his ***Campephaga aurulenta*** being a synonym of ***C. sloetii***.

The following extract was read from a letter addressed to the

Secretary by Mr. William Summerhayes, dated Aroa, Venezuela, February 19, 1874:—

"I have read carfully your Monograph on the Cracidæ: there is no doubt of the correctness of your identification of both *Crax daubentoni* and *Pauxi galeata*.

"I have shot specimens of both kinds in this neighbourhood, and compared them diligently with your Latin descriptions, on the accuracy of which I beg to compliment you. The *Crax daubentoni* is found here all along the littoral as far as the foot of the mountains (here some 50 or 60 miles inland); but as soon as you get among the mountains (and these mines, whence I write, are only some 5 miles up the Sierra and away from the forest which clothes the littoral flat country) you see no more of the *C. daubentoni*, but numerous specimens of *Pauxi galeata*."

The following papers were read:—

1. On the Nature of the Sacs vomited by the Hornbills.

By Dr. James Murie, F.L.S.

[Received May 9, 1874.]

Lapse of time has not erased from my memory the puzzled countenance, not to say blank dismay, of my friend Mr. A. D. Bartlett, on my announcing to him my conclusions respecting the nature of a fig-like envelope containing discoloured grapes, which he suspected had been thrown up by the Wrinkled Hornbill, *Buceros corrugatus*. His alarm for the safety of the bird was converted into mirth at my expense, as a few days afterwards, he returned with a second specimen ejected from the same bird. The latter, it would seem then, was none the worse for losing *the interior lining of his stomach*, and in the interval had made a new one and got rid of it also.

I certainly, at the time, was not prepared for the full extent of the phenomenon. But I felt satisfied from my examination that the sac was not what is ordinarily regarded as a secretion (namely, glandular product), but rather was of an epithelial horny kind—the veritable gizzard-lining itself, howsoever reproduced.

In Mr. Bartlett's cleverly reasoned paper, P. Z. S. 1869, p. 143, an abstract of my report to him is given. He opposed the notion of the rejected sac being a true gastric lining, and held to its being a secretion provided for and emitted during the breeding-season. He regarded it as of a nature similar in kind to the proventricular secretion of incubating Pigeons, Parrots, &c. As to its greater solidity and gizzard-membrane characters, these he deemed producible by that viscus, and to be analogous to the gastric mouldings of the indigestible pellets cast up by the Raptorial and Insessorial birds. At the discussion on the paper my statement of the sac being the epithelial coating of the gizzard was received incredulously.

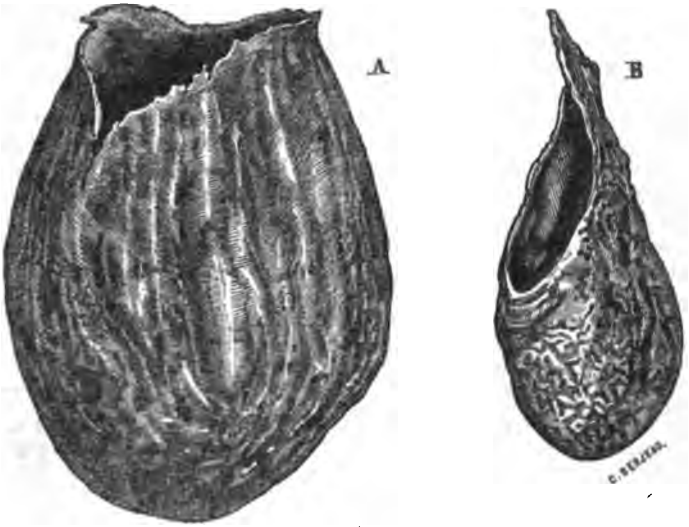
The sac and its contents, and subsequently the viscera of the bird itself, which died shortly after, were consigned to the College-of-Surgeons' Museum, and mounted as preparations. Professor Flower carefully examined and compared the above.

In his notice of the object (P. Z. S. 1869, p. 150) he found the stomach possessing its apparent natural coat. Whence, therefore, had the other come? He confirmed my statement of the identity in structure of the expelled sac and the internal epithelial layer of the cavity of the gizzard. Both behaved the same to chemical reagents; microscopical sections of each exhibited a like matrix slightly laminated with scattered nuclei and granules. He failed, however, in either to detect the definite structures ascribed to the inner coat of graniferous birds.

There still remain some obscure and hitherto unexplained points connected with the production of these anomalous food-bags, which it is the purport of the present paper to unravel. However incongruously it may sound, Mr. Bartlett and myself were both right and both wrong—he correct in suspecting the substance to be a periodical regurgitation normally coincident with the process of incubation, in error in believing it to be a secretion derived from the proventriculus or glands opening into the alimentary canal above that. I was justified in its being the epithelial layer of the gizzard, but deceived as to its being cast off through morbid influences.

From indubitable evidence on the habits of the wild birds and frequent occurrence of the phenomenon in specimens in the Society's Menagerie, as described by Mr. Bartlett, there is validity in assuming that the vomiting of food enclosed in a horny sac is common to

Fig. 1.



Empty gizzard-sacs ejected by the Subcylindrical Hornbill, *Buceros subcylindricus*, about natural size.

the Hornbill group, the undermentioned instance (occurring in an African species now alive in the Gardens) substantiating such a view.

The accompanying woodcut (fig. 1, A) illustrates the exterior appearance of one of the objects in question. Its history is as follows:—"This case was thrown up by the Subcylindrical Hornbill (*Buceros subcylindricus*, Sclater), August 5th, 1872. The bird had commenced to peck it to pieces and eat the fruit it contained at the time it was thrown up. The keeper caught the bird (a male) in the act of eating it." The drawing (fig. 1, B) represents another of the sacs, which, as I was informed, came from the same bird, but was cast up at a later date, the precise date not being noted. Both retain, pretty correctly, the rugose character observable when freshly expelled, although they were kept in spirits prior to being sketched. That lettered A is much larger than B, on account of the contained food having been removed and cotton in sufficient quantity replaced, so as to prevent undue shrinkage. It is therefore of tolerably natural dimensions. The fruit enclosed within B was left in place; but it, as well as the wall-membrane, had contracted very considerably from its original size. The contrast between the two is instructive as showing behaviour virtually the counterpart of the corneous gastric texture; and this similarity of tissue is confirmed when a portion is dried, it then becoming translucent and brittle.

It would be superfluous for me to say more concerning the external aspect and contents of these figured sacs, other than that they agree in every particular with Mr. Bartlett's, Professor Flower's, and my own descriptions already published—with the exception that the smaller one contained, in addition, a gooseberry. Their intimate microscopic texture is of more consequence, and, as I apprehend, affords a clue to the solution of the problem. For this reason I have been particular in making accurate sketches under different magnifying-powers.

I may premise by stating that certain portions of the tissue of the two sacs differ in one essential particular, this very discrepancy, however, elucidating and tiding over a difficulty. In brief, it most conclusively demonstrates that the constituents, at this part at least, can be no other than the entire thickness of the horny layer of the gizzard. According to the researches of Molin *, Flower †, Hasse ‡, and others §, the inner coat of the gizzard in various orders and families of birds (*strato epiteliale*, Molin) is composed of a corneous, and, in thin slices, pale yellow transparent substance. The lower surface of this lies upon the subjacent follicular layer (Flower), the former dovetailing with the papillæ of the latter. As the horny layer ascends it exhibits a series of vertical, parallel, and cylindrical columns, each homogeneous in composition and with intervening epithelio-granular substance. Towards the free surface the columnar character ceases, and is replaced by loosely arranged epithelium-scales. In some genera of birds the columns are found to be tolerably regular and equidistant; in others they are more unequally distributed or form aggregated groups.

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* "Sugli stomachi degli uccelli," in Denkshr. d. Acad. zu Wien, 1852, vol. iii. pt. 2, p. 1, tab. i.–iv. A well-illustrated investigation.

† "On the structure of the Gizzard of the Nicobar Pigeon and other Granivorous Birds," P. Z. S. 1860, p. 330, pls. 175, 176. Substantiates the conclusions of the foregoing author.

‡ "Beiträge zur Histologie des Vogelmagens," Zeitsch. f. ration. Med. vol. xxviii. p. 1. As bearing on the question of bird-secretions, see also his paper, "Ueber den Œsophagus der Tauben, &c.," Henle and Pfeuffer's Zeitsch. vol. xxiii. p. 101. Also Bergmann "Einiges über den Drüsenmagen der Vögel," Reich. & D. B. Reymond's Archiv, 1862, p. 581.

§ Berlin, in Ned. Lanc. July and Aug. 1852, quoted by Kölliker; but the original article I have not seen. Leydig, in his 'Histologie,' p. 309, gives an en-

A portion, though, I find, (not the whole) of the large sac obtained from the Subcylindrical Hornbill corresponds in its minute structure with the above description in every particular. In the vertical section (A, fig. 2, p. 424), and more highly magnified portion of the same (B), short tubular prolongations are observed inferiorly. These, in some instances, have a compound character terminally, while optically deeper or beyond them others similar in kind are visible. By different focusing of the object, a granular and partly fibro-cellular thin connective layer is seen, moreover, to invest the tubes just above their free ends. This produces an appearance suggestive of the lower extremities, seeming tubules, being short, compound, granular flasks, which decidedly they are not, but only the unequal extension of the homogenous pillars above mentioned. These latter, in this perpendicular view, are long rods barely to be distinguished from the intermediate substance, on account of the latter being less transparent. At different levels, more defined indications of horizontal stratification or lamellar layers obtain. At the top of the rods there is a copious development of large nucleated and granular columnar epithelium. Here and there also some of the tubules have been squeezed out, and, along with the narrow ends of epithelial scales, present an irregular fringed margin. In the horizontal sections of the same object (C, D, E), the solid nature of the rods is manifest, and it becomes abundantly evident that several rods (averaging 4 to 5) lying in apposition constitute a column or cylindrical bundle. These latter are dispersed at tolerably equidistance, though not precisely regular in contour or calibre; and this causes a grade or variety in the pattern. From the difficulty of cutting a perfectly flat, uniform section, a partly tangental one occasionally results; but this more clearly shadows forth the coalescence of the homogeneous rods, and how their aggregation into pillars is effected. At other places it likewise admits of the molecules and nucleolar-celled character of the intercolumnar tissue being studied.

With regard to the other smaller sac, I have not been fortunate in my search to obtain tissue answering to the above cylindroid character, but find it simpler or less differentiated in its elements, agree-

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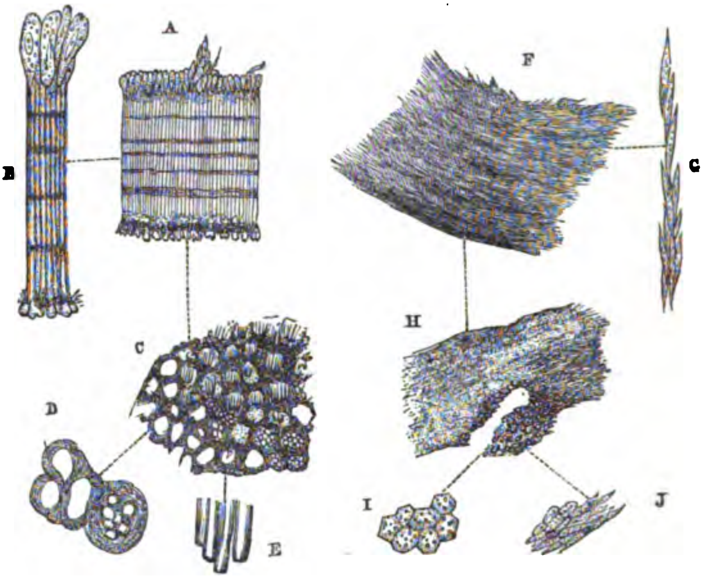
larged vertical section through all the coats of the stomach of the Heron, which well enables the relations of the strata to one another to be studied. Klein, in his articles "Œsophagus" and "Stomach" in Stricker's 'Manual,' pp. 536 & 554.

ing nevertheless with parts, other than that above described, of the large sac. The most notable and obvious distinction, then, consists in the absence of the homogeneous pillars and therefore looped network of intermediate substance. Instead of these, there are but continuous wavy and horizontally stratified layers of epithelium and

Fig. 2.



Illustrations of the microscopical tissues and elements forming the sacs ejected by the Subcylindrical Hornbill.

A. Vertical section, through the entire thickness of the part, exhibiting upright cylinders, inferior prolongations, and superior free columnar epithelium.
B. Small piece of the same, more highly magnified.
C. Horizontal section from about the middle of A, displaying the cylinders or aggregate rods both somewhat obliquely and when cut straight across; together with the intermediate substance or epithelio-granular meshwork.
D. Still further enlarged piece of the same section.
E. Protruding cylinder of rods, very considerably magnified.
F. Vertical section (corresponding to A), showing no cylindrical arrangement, but wavy stratified layers of an epithelial character.
G. Partial layer of its epithelium under a higher power, but transposed uprightly.
H. Horizontal section from about the middle of E, showing absence of the cylinders and that it is composed of epithelium and nucleolar corpuscles in various stages of development.
I. Some of the polygonal or tessellated, horny, nucleated scales of H, enlarged.
J. Another view of the epithelium, showing transition from oval to elliptical character.

granules of various stages of development throughout its entire thickness. These, moreover, appear to be piled in tiers, marked by darker bands of the tissue—that is, are densest at the lines (consult respectively F, G, H, I, J, fig. 2, p. 424). According to the direction in which the razor has been passed, the polygonal, oval, oatshaped, or linear aspect of the epithilium is revealed. The upper free margin (of E) has a ragged edge, where the scales have a tendency to desquamate; whereas the opposite lower or attached margin is smooth-edged and denser in quality. Thus tufts or prolonged rods to fit into the interspaces of the underlying follicular layer are wanting, evincing therefore other conditions to the relative disposition of the parts. (Compare the drawings F and A, fig. 2, p. 424, which correspond as to magnitude and direction made.)

Having correlated the sac to the gizzard, we narrow the question, though we still have to explain physiologically how reproduction of fresh and successive linings is effected whilst the viscus, so to say, remains intact. It should be borne in mind, then, that the film of firm membrane in question is to all intents a true corneous structure, and comparable therefore with the outer stratum of the skin or epidermis, ordinary horn, or, in the case of the cylinder variety, with the horn of the Rhinoceros. The successive and rapid development of cells from below pushing onwards those above would readily admit of desquamation *en masse*, and without interfering with a fresh growth. Indeed there is ample testimony of scaly strata in the microscopical sections in support of this view, which accords moreover with the regeneration and metamorphosis of corneous textures generally. That the ejected sac should retain the shape and peculiar corrugated appearance of the interior of the gizzard is not to be wondered at when we consider that it is but a solid though flexible impress of the sinuosities, elevations, and depressions of the mucous folds of that organ.

2. Description of the *Ovis poli* of Blyth.

By Dr. F. Stoliczka, Naturalist to the Yarkund Mission.

[Received May 24, 1874.]

(Plate LIII.)

Ovis poli, Blyth. (Plate LIII.)

Male, in winter dress.—General colour above hoary brown, distinctly rufescent or fawn on the upper hind neck and above the shoulders, darker on the loins, with a dark line extending along the ridge of tail to the tip. Head above and at the sides a greyish brown, darkest on the hind head, where the central hairs are from 4 to 5 inches long, while between the shoulders somewhat elongated hairs indicate a short mane. Middle of upper neck hoary white, generally tinged with fawn; sides of body and the upper part of the limbs shading from brown to white, the hair becoming more and more tipped with the latter colour. Face, all the lower parts, limbs, tail, and all the hinder parts, extending well above towards the loins, pure white.

See Biddulph's letter P.Z.S. Mar./75. p. 156

Gordon says that the Sirikol Ovis Poli is known as [illegible] 'Arkal' or 'Argal'

The hairs on the lower neck are very much lengthened, being from 5 to 6 inches long. Ears hoary brown externally, almost white internally. Pits in front of the eye distinct, of moderate size and depth, and the hair round them generally somewhat darker brown than the rest of the sides of the head. The nose is slightly arched and the muzzle sloping. The hair is strong, wiry, and very thickly set, and at the base intermixed with scanty, very fine fleece; the average length of the hairs on the back is from 2 to 2½ inches. The iris is brown. The horns are subtriangular, touching each other at the base, curving gradually with a long sweep backwards and outwards; and after completing a full circle, the compressed points again curve backwards and outwards; their surface is more or less closely transversely ridged.

The following are measurements taken from a full-grown male, though not the largest in the mission collection:—

	inches.
Total length from between the horns to tip of tail	62
Length of head	13·25
Tail (including the 1½″ long hair at tip)	5·5
Distance between snout and base of ear (the eye lies below this connecting line)	12·75
Distance between base of ear and the eye	3·25
Distance between snout and eye	8·5
Distance from the contact of horns to snout	12
Breadth between the anterior angle of eyes	6
Length of ear in front	4·75
Height of shoulder (the hair being smoothed, beginning from the edge of the middle of the hoof at the side)	44
Girth round the breast	51·5
Length of one horn along the periphery	48
Circumference of one horn at base	15
Distance between the tips	38

The colour of full-grown females does not differ essentially from that of the males, except that the former have much less white on the middle of the upper neck. The snout is sometimes brown, sometimes almost entirely white, the dark eye-pits becoming then particularly conspicuous. The dark ridge along the tail is also scarcely traceable.

In size, both sexes of *Ovis poli* appear to be very nearly equal; but the head of the female is less massive, and the horns, as in allied species, are comparatively small: the length of horn of one of the largest females obtained is 14 inches along the periphery, the distance at the tips being 15 inches, and at the base a little more than 1 inch. The horns themselves are much compressed; the upper anterior ridge is wanting on them; they curve gradually backwards and outwards towards the tip, though they do not nearly complete even a semicircle.

In young males, the horns at first resemble in direction and slight curvature those of the female, but they are always thicker at the base and distinctly triangular.

The length of the biggest horn of male along the periphery of curve

Dec. 1874 - Yule writes me that Gordon has described a pa
of horns each 65 inches on the curves. & 11 inches in circumf
thes -

was 56 inches, and the greatest circumference of a horn of a male specimen at the base 18½ inches.

Mr. Blyth, the original describer of *Ovis poli*, from its horns, was justified in expecting, from their enormous size, a correspondingly large-bodied animal; but, in reality, such does not appear to exist. Although the distance between the tips of the horns seems to be generally about equal to the length of the body, and although the horns are very much larger, but not thicker or equally massive with those of the *Ovis ammon* of the Himalayas, the body of the latter seems to be comparatively higher. Still it is possible that the *Ovis poli* of the Pamir may stand higher than the specimens described, which were obtained from the Thian Shan range.

Large flocks of *Ovis poli* were observed on the undulating high plateau to the south of the Chadow-Kul, where grass vegetation is abundant. At the time the officers of the Mission visited this ground, *i. e.* in the beginning of January, it was the rutting-season. The characters of the ground upon the Pamir and upon the part of the Thian Shan inhabited by these wild sheep are exactly similar.

3. On a new Genus and Species of Bird from the West Indies. By R. Bowdler Sharpe, F.L.S., F.Z.S., &c., Senior Assistant, Zoological Department, British Museum.

[Received May 30, 1874.]

(Plate LIV.)

In a collection of Jamaican birds recently received by Mr. A. Boucard of Great Russell Street, there occurred a bird for the examination of which I am indebted to him.

It appears to be closely allied to *Phœnicophilus palmarum*, but nevertheless to be generically distinct. I propose to call it

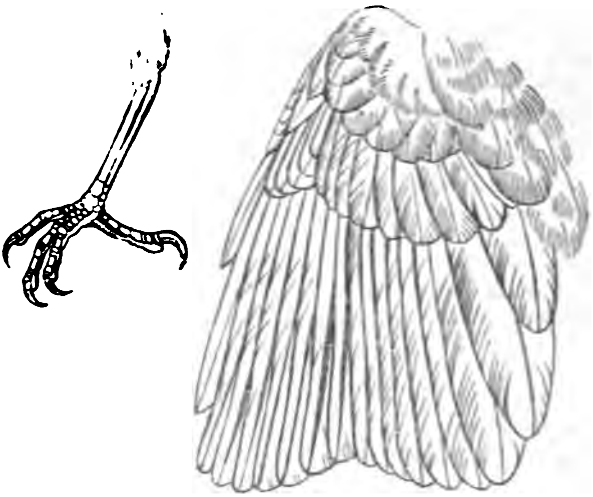
PHŒNICOMANES, gen. nov.

Allied to *Phœnicophilus*, but easily distinguished by its longer and more attenuated bill and especially by its short first primary. The type is

PHŒNICOMANES IORA, sp. nov. (Plate LIV.)

Above blackish, with a deep indigo lustre, many of the feathers of the crown and back tinged with yellow, apparently the remains of a previous plumage; forehead brighter yellow; lores and a distinct eyebrow bright yellow, as also are the rest of the sides of the face, excepting the upper margin of the ear-coverts, which are blackish; quills blackish, the primaries narrowly margined with yellow, the secondaries very broadly with indigo; rump and upper tail-coverts greyish, the feathers very fluffy and washed slightly with yellowish; tail black, glossed with dull indigo, and crossed with indistinct wavy lines when held to the light; entire under surface brilliant yellow, the flanks very long and fluffy, inclining to greyish white, slightly tinged with greenish; under wing-coverts and inner lining of quills white, with a slight tinge of bright yellow on the bend of the wing. Total length 5·7 inches, culmen 0·9, wing 2·8, tail 2·3, tarsus 0·9.

Hab. Jamaica.



Foot and wing of *Phœnicomanes iora*.

I have chosen the specific name *iora* because of the extraordinary resemblance which the bird bears to the members of that eastern genus, even to the half black and green plumage which is so often met with. I have shown the unique specimen of the type to Mr. Sclater, who indicated to me the probability of the true affinities of the bird being with *Phœnicophilus*; and he is of opinion that these two forms belong rather to the *Vireonidæ* than to the *Tanagridæ*, with which *Phœnicophilus* is generally placed.

Lastly I have taken pains to ascertain the exact habitat of the species, and believe that M. Boucard's assurance of its Jamaican origin is to be relied on.

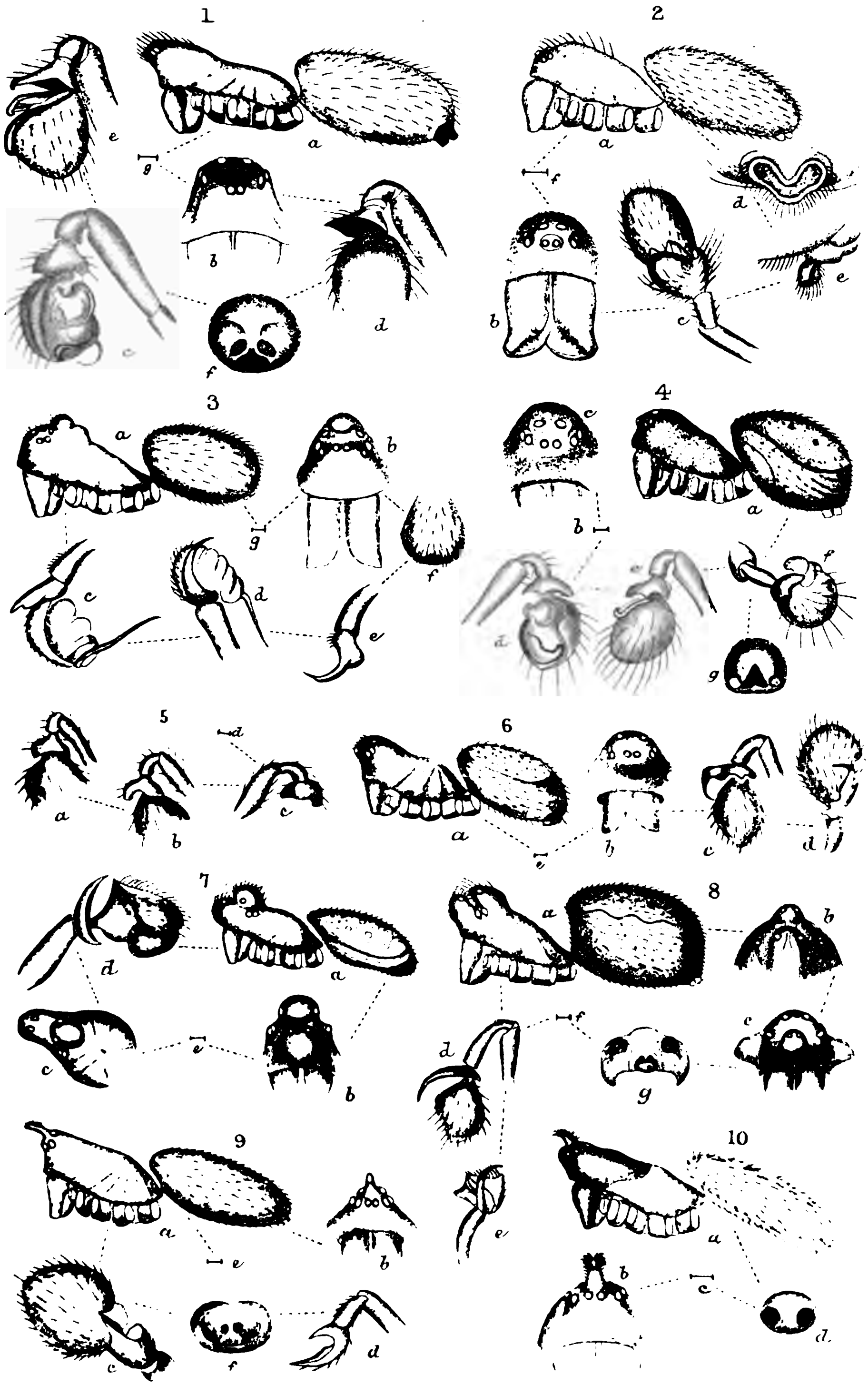
4. On some new Species of *Erigone* from North America.

By the Rev. O. P. Cambridge, M.A., C.M.Z.S.

[Received June 2, 1874.]

(Plate LV.)

A small collection of minute Spiders, all belonging to the genus *Erigone* (Westr.), and received in January last from Mr. J. H. Emerton, of Boston, Massachusetts, U.S.A., contained twelve species; of these, two are identical with species found in Europe, and ten



O. P. Cambridge delt.
A. T. Hollick lith.

New Species of Erigone from North America

W. West & Co. imp.

appear to have been hitherto undescribed. Descriptions and figures of these new species are subjoined, as also of another of the same genus received from the Oregon Territory, where it was found by Lord Walsingham, who kindly sent it to me among some other Spiders.

The discovery of Spiders of this curious group in North America is very interesting. It may be said now that the genus *Erigone* occurs over the greater part of the Northern hemisphere. I have received examples of it from Baikal (in the east) to Oregon (in the west), its southernmost limits at present known being Morocco and Cairo; and it has been sent to me also from North Greenland.

The new species now described are brighter and more richly coloured than the greater portion of known European species; and nearly all of them (though severally belonging to very distinct groups of the genus) have more or less of the caput black, the thoracic region being either yellow or rich orange; the occurrence of these two distinct, and distinctly defined, colours on the cephalothorax is unknown, so far as I am aware, in any of the numerous species found in Europe.

From the information received from Mr. Emerton we may expect to find that North America will, when fairly searched, prove exceedingly rich in the species of these minute Spiders; and probably among them there will be found some presenting new and grotesque forms of the caput, and perhaps still more (apparently) eccentric structures in the palpi and palpal organs of the male than we find even now in many known species, while at the same time we shall probably find many among them identical, or nearly so, with European forms.

My thanks are especially due to Mr. Emerton and Lord Walsingham for giving me the opportunity to describe and figure the subjoined novelties.

Genus Erigone (Westr.).

Erigone atra.

Erigone atra, Bl. Edinb. Phil. Mag. iii. No. 15, p. 195.

Neriene longipalpis, Bl. Spid. Great Brit. & Ireland, p. 274, pl. xii. fig. 188, and pl. xxii. fig. C.

Erigone vagabunda, Westr. Aran. Suec. p. 597.

An adult male example, which I cannot distinguish from the above species, was contained in the small collection of the genus *Erigone* kindly sent me in January last from Boston, Massachusetts, U.S.A., by Mr. J. H. Emerton. It was found at Beverley, Mass., in June 1873.

Erigone dentigera, sp. n.

Adult male, length very nearly 1½ line.

This species is very nearly allied to *E. longipalpis* (Sund.), both in size, colour, and form, but may easily be distinguished from it by a small but very distinct tooth-like spine beneath the radial joint of the palpus and by the less-pointed form of the fore extremity of that joint.

The cubital joint of the palpus is distinctly longer than the radial.

From *E. dentipalpis* (Wid.) and *E. promiscua* (Cambr.), both of which have a tooth-like spine beneath the radial joint of the palpus, it may also be readily distinguished by being larger, as well as by decided differences in the form of the fore extremity of that joint; and from all others it differs slightly in the structure of the palpal organs.

A single example was contained in Mr. Emerton's collection, and was found by him at Beverley, U.S.A., in June 1873.

ERIGONE INTERPRES, sp. n. (Plate LV. fig. 1.)

Adult male, length 1¼ line.

The whole of the fore part of this Spider is yellow, the cephalothorax and falces being strongly tinged with orange; the ocular region and a small space around it is black, and furnished thickly with bristly hairs; the abdomen is a light drab colour, obscurely reticulated with a paler hue, the spinners and a small margin round them being black; the fore part of the caput is somewhat produced; the clypeus is impressed, and exceeds in height half that of the facial space; looked at in profile the ocular region has a somewhat obliquely truncate appearance.

The *eyes* are small, dark, rather obscure, and not greatly unequal in size; they occupy the whole width of the extremity of the caput, forming a pretty regular transverse oval figure double the length of its width; the foremost row is rather the shortest and least curved; those of the hinder row are equidistant from each other; those of each lateral pair are seated a little obliquely on a slight tubercle; those of the fore central pair are very obscure, small, and nearly contiguous to each other, and the interval between each and the fore lateral nearest to it is very nearly equal to that between each hind central and the hind lateral next to it.

The *legs* are long and slender; their relative length appeared to be 1, 4, 2, 3, though those of the second pair are very nearly if not quite as long as those of the fourth: they are furnished with hairs and a few bristles; one of these latter, stronger than the rest, or almost more properly called a slender spine, arises from the fore side of each genual joint.

The *palpi* are strong but short, and similar in colour to the legs, except the digital joints, which are brown, and the fore parts of the radials, which are strongly tinged with black; the cubital joint is very short, rounded above, and somewhat nodiform in appearance: the radial is of the same length as the cubital, strong, and rather spreading; its fore extremity is produced in a somewhat obtusely angular form, and there is a small tooth-like projection directed downward beneath its extreme point. The digital joint is rather large, of a roundish form; and the palpal organs are prominent and complex; at their extremity is a strong tortuously curved spine, and near it a slender, filiform, curved, and more prominent one; beneath their hinder extremity on the outer side is also a strong and rather prominent irregular bent corneous process.

The *falces* are moderately long and strong; they are prominent near their base in front, and have rather a backward direction.

The *maxillæ* are strong, slightly curved, and much inclined to the *labium*, which is short and rounded at its apex.

The *abdomen* is oval, moderately convex above, and projects a little over the base of the cephalothorax; it is very thinly clothed with hairs, and is of a dull pale drab-yellow colour, faintly reticulated with a paler hue; and a very small portion of its hinder extremity, including the spinners, is black.

The female resembles the male in general characters and colours; the genital aperture is small and simple in form.

Adults of both sexes of this Spider were contained in the collection kindly sent to me by Mr. J. H. Emerton, and were found by him at Holyoke, Mass., in July 1873. It is a very pretty and distinct species, the colours yellow, orange, and black, contrasting strongly with each other. Its nearest congeners appear to be the Spiders of the group to which *Erigone* (*Neriene*) *sylvatica* (Bl.) belongs—the genus *Bathyphantes* (Menge).

ERIGONE PROBATA, sp. n. (Plate LV. fig. 2.)

Adult male, length 1¼ lines.

The *cephalothorax* is of the ordinary general form; but the occipital region of the caput is gibbous, and the normal grooves and indentations are fairly marked; it is of a darkish yellow-brown colour, the surface appearing to be very thickly but minutely punctuose; and there is a single central longitudinal row of nearly erect bristly hairs from the eyes to the thoracic junction. The height of the clypeus exceeds half that of the facial space.

The *eyes* are of moderate size, and seated on slight black tubercles; they are in two transverse curved rows, the foremost row being the shortest and straightest; those of the hind central pair are about an eye's diameter distant from each other, but nearer together than each is to the hind lateral on its side; those of the fore central pair are smallest of the eight, and are separated from each other by an interval of about half an eye's diameter, each being separated from the hind central nearest to it by the diameter of the latter, and from the fore lateral on its side by the latter's diameter; the laterals are seated obliquely on a strong tubercle, and are contiguous to each other.

The *legs* are rather long and tolerably strong, their relative length being 4, 1, 2, 3; they are of a brightish yellow colour, and furnished with numerous hairs and fine bristles, some of the former being erect.

The *palpi* are short; the humeral and cubital joints rather slender; the radial is strong, a little longer than the cubital, and spreads out on all sides, its fore half being black and somewhat irregularly but boldly notched or emarginate; the colour of the hinder part is orange red-brown, that of the cubital and humeral joints yellow, and the digital, which is oval, yellow-brown; the palpal organs are well developed and rather complex, with spines and corneous processes, one of the latter beneath their fore extremity being furnished with a row of fine comb-like teeth.

The *falces* are long, strong, and prominent near their base in front; near their inner extremity in front is a single strong sharp tooth; and along their inner edge, beneath the fang, are some other smaller teeth; their colour is similar to that of the cephalothorax.

The *maxillæ* are long and strong, slightly curved, and inclined to the *labium*, which is short and of a somewhat semicircular form; the colour of these parts is similar to that of the legs.

The *sternum* is heart-shaped, of a dark yellow-brown colour, and furnished with a few longish erect bristly hairs.

The *abdomen* is oval, not very convex above, but projecting considerably over the base of the cephalothorax; it is of a dull blackish brown colour, clothed thinly with hairs.

The *adult female* is larger than the male; the abdomen is more convex above, as well as much larger; the *falces* want the strong sharp tooth in front near their extremity; but in other respects there is but little difference.

The form of the genital aperture is peculiar, and the process connected with it is large and prominent.

Two adults of each sex were contained in a small collection of Spiders kindly collected for me in Oregon Territory in 1872 by Lord Walsingham. It is a fine species, and, although allied to several European ones, is yet very distinct from all of them.

ERIGONE SPINIFERA, sp. n. (Plate LV. fig. 3.)

Adult male, length rather less than 1 line.

The *cephalothorax* of this species is of a dark but dull yellow-brown colour, with the normal grooves and indentations well marked, and (as also the margins) of a darker hue; it is of a round oval form, the lateral constrictions on the margins at the caput being exceedingly slight; the fore part is bluff and bold; and immediately behind the eyes is a nearly round but not very large somewhat tuberculiform eminence; and directly behind this the occiput is a little gibbous, giving (in profile) the appearance of a double eminence; the ocular region, as well as the eminence behind it, is furnished with a few short coarse hairs; and the height of the clypeus is at least two thirds of that of the facial space.

The *eyes* are small, not greatly unequal in size, and, although preserving the usual general position, yet present a remarkable similarity in their actual position to that of the genus *Enyo*—namely, three groups, two of three eyes each, forming a curved line at each end of a transverse oblong space, and between these two groups is a third, of two eyes near together. This grouping is occasioned by the unusual relative distance between the eyes of the hind central pair, bringing each of them within less than an eye's diameter of the hind lateral eye on its side; those of each lateral pair are seated a little obliquely on a tubercle; the fore centrals are inconspicuous, being seated on a dark spot, and contiguous to each other; the length of the line formed by the eyes of the hind central pair is less than that formed by the two fore laterals, and would almost exactly lie between them; each fore central eye forms, with the fore lateral and hind central on its side, as nearly as possible an equilateral triangle.

The *legs* are rather long and slender; their relative length is 4, 1, 2, 3; they are of a clear light orange-yellow colour, furnished with hairs and a few slender erect bristles; and each tarsus ends with three small black claws.

The *palpi* are short, tolerably strong, and similar in colour to the legs, except the radial and digital joints, which have a dark greenish olive hue; the cubital joint is long, nearly as long as the humeral joint, and enlarges gradually to its fore extremity. The radial joint is exceedingly short; it is a little prominent behind, and has a group of small hairs on its outer side; its fore part is produced into a long curved apophysis, having its sharp somewhat thorn-like and rather suddenly-formed point directed outwards and rather upwards. The digital joint is small and of a roundish oval form. The palpal organs are highly developed, prominent, and rather complex; from their extremity on the outer side there curves out a long, slender, tapering, sharp-pointed prominent nearly straight spine: this spine is very conspicuous and characteristic from its straightness.

The *falces* are moderate in length and strength, of a yellow-brown colour, and present no remarkable feature.

The *maxillæ* are strong, the basal portion exceedingly so; they are curved and inclined to the *labium*, which is short and semicircular. The maxillæ are rather paler in colour than the falces, and whitish at their extremities; the *labium* is darkest, with a pale apex.

The *sternum* is large, heart-shaped, convex, and very glossy, of a dark yellow-brown colour suffused with blackish.

The *abdomen* is oval, tolerably convex above, and projects a little over the base of the cephalothorax; it is of a dull blackish colour, marked above with some lines and spots of a clear yellow-brown (probably not very visible except when in spirit of wine), and clothed pretty thickly with coarse hairs.

An adult female which accompanied the male above described was rather larger and darker-coloured; the occiput was simply rounded; the height of the clypeus much less, and the eyes of the hinder row equidistant from each other. These differences are frequently observable in females of those *Erigonæ* whose males have gibbosities and eminences on the caput; and it is most probable that the two Spiders here described are, as their captor has supposed, the sexes of the same species; still it is quite possible they may not be so. The genital aperture is small, and of a very simple form.

These two Spiders, of which the male is an exceedingly interesting and distinct form, allied to *E. apicata* (Bl.), *E. retusa* (Westr.), and still more nearly to *E. excisa* (Cambr.), were received from Mr. Emerton, of Boston, Massachusetts, by whom they were captured in that neighbourhood (Milton, Mass.) among moss, in October 1873.

ERIGONE LÆTA, sp. n. (Plate LV. fig. 4.)

Adult male, length ⅘ line.

The *cephalothorax* is of an ordinary short-oval form: the caput has [illegible] held [illegible] the [illegible] below the [illegible] and [illegible] the [illegible] the [illegible] : the whole [illegible]

[illegible] and not [illegible] the [illegible] are [illegible] are the [illegible] and [illegible] are [illegible]

[illegible] rather [illegible] they are yellow. [illegible] with short [illegible].

[illegible] with a few [illegible] The [illegible] rather on the [illegible] a little [illegible] and there is a [illegible] the digital [illegible] and [illegible] complex [illegible]

[illegible] a curved profile-line [illegible].

[illegible] similar in colour [illegible]

[illegible] -brown colour, [illegible]

[illegible] above, [illegible] its upper sur- [illegible] form a [illegible] clothed [illegible] colour; [illegible] with [illegible].

[illegible] velvety [illegible] will

short black hairs, and the middle of the upperside marked with four orange-yellow-brown impressed spots, forming a quadrangular figure, whose fore side is much the shortest. The genital aperture is simple and of a triangular form.

Adults of both sexes of this pretty *Erigone* were contained in Mr. Emerton's series of North-American Spiders found at Cambridge, Mass.; it is allied to *E. depressa* (Bl.) and *E. brevipes* (Westr.), but differs remarkably in colours, and also in some other material respects.

Erigone lætabilis, sp. n. (Plate LV. fig. 5.)

Adult male, length ¾ line.

This Spider is very closely allied and very similar to the foregoing species (*E. lætu*); it may, however, be readily distinguished by its smaller size and (in the only example examined) paler colouring; the humeral joint of the palpus is only of ordinary strength; the radial joint is stronger than in *E. læta*, and less produced in front at its extremity, which is rather abruptly terminated in a somewhat hooked form, and there is no angular point at the middle of the inner side; the palpal organs differ a little in structure, and the coiled spine at their extremity is shorter, less strong, and less filiform at its point; the caput appeared to be quite smooth and destitute of punctures, which, however, were visible on the thoracic portion of the cephalothorax; and the sternum is covered with largish punctures or pockmarks.

The sides and hinder part of the abdomen are of a plain pale yellowish colour, and, as well as the upper coriaceous epidermis, thinly covered with black hairs. Unless the above points are carefully noted, this species will be easily confounded with *E. læta*.

A single example of the adult male was found among the examples of *E. læta* in Mr. Emerton's collection.

Erigone emertoni, sp. n. (Plate LV. fig. 6.)

Adult male, length ¾ line.

The cephalothorax, falces, maxillæ, labium, and sternum of this species are yellow; the legs and palpi are of a paler yellow; and the abdomen is of a dull pale drab colour, the greater part of its upper surface being covered by a coriaceous punctuose epidermis of a dull orange-brown colour; the caput is slightly elevated and produced in a bluff form, the extremity, looked at in profile, having a somewhat truncate appearance; the ocular region is suffused with black, and furnished with some short bristly hairs; the height of the clypeus (which is impressed across the middle) exceeds half that of the facial space.

The *eyes* are on black spots, in four pairs, on the bluff end of the caput; those of the hind central pair are rather further from each other than each is from the hind lateral nearest to it; those of the fore central pair are the smallest of the eight, and contiguous to each other, each being separated from the hind central nearest to it by nearly the same interval as that which divides those of the hind central pair; those of each lateral pair are placed slightly obliquely, A single adult male of this pretty and very distinct species was contained in Mr. Emerton's North-American collection, and was found by him under leaves at Cambridge, Massachusetts, in December 1873.

ERIGONE CRISTATA.

Walckenaera cristata, Bl. Spid. Great Brit. & Ireland, p. 309, pl. xxi. fig. 224.

A single adult male of this Spider was found in Mr. Emerton's collection; on careful comparison with English examples I am unable to find any difference between them and the American example.

ERIGONE FISSICEPS, sp. n. (Plate LV. fig. 8.)

Adult male, length $\frac{1}{6}$ line.

The *cephalothorax* is short and obtuse, but prominent and elevated before, the extremity of the caput being divided into two lobes by a deep cleft or fissure reaching down to the lateral eyes on either side; the hinder lobe is the strongest; it is rounded on the occipital portion, and its upper part on the fore side projects a little over the fissure; the clypeus is slightly prominent in the middle, and very slightly exceeds in height half that of the facial space; the colour of the cephalothorax is dull orange-yellow, the upper portion of each lobe of the caput being strongly suffused with black, the suffusion continuing in a short broad band a little way back over the occiput.

The *eyes* are small, on small black spots, and in four pairs, one pair on the fore part of the hinder lobe of the caput, rather more than two diameters from each other, another pair on the summit of the front lobe, the smallest of the eight, and about an eye's diameter from each other; those of each lateral pair are contiguous to each other and placed on a slight tubercle just behind the termination of the cleft; the interval between each hind lateral eye and the hind central nearest to it is equal to that which separates those of the hind central pair from each other.

The *legs* are rather short and slender, relative length 4, 1, 2, 3; their colour is yellow; and they are furnished with short fine hairs, of which several on the uppersides are erect.

The *palpi* are rather long, and similar in colour to the legs; the cubital joint is long, slightly bent, and increasing in size gradually to the fore extremity; the radial joint is exceedingly short, slightly prominent behind, but has its fore side produced into a long curved tapering, but not very sharp-pointed, prominent apophysis; the digital joint is small, and of a somewhat irregular form, having a boldish subangular prominence near its base; the palpal organs are prominent, but not very complex, with a small curved black sharp-pointed spine towards their fore extremity.

The *falces* are small and not very strong; their length is about equal to the height of the facial space; their colour, as well as that of the maxillæ, labium, and sternum, all of which are of normal form, is like that of the cephalothorax.

The *abdomen* is large, of a round-oval form, very convex above, indentations (slightly) dusky blackish, the occipital eminence and the upper part of the frontal prominence being black; some portion of the thorax is minutely punctuose; but the dark part of the caput is very smooth and glossy, and furnished with hairs, mostly directed forwards and backwards over the indentation dividing the two lobes; those on the fore part of the occipital lobe are the most numerous and strongest. The form of the cephalothorax, it will be seen, much resembles that of the European species *E. parallela* (Bl.) and *E. latifrons* (Cambr.).

The *eyes* are in the usual four pairs; but the position of those of the two lateral pairs is remarkable, being placed much further backwards than ordinarily; those of the hind central pair are on the sides of the fore part of the occipital eminence, and separated from each other by an interval of about two diameters; those of the foremost pair are on the highest part of the frontal lobe, and are nearer together than those of the hind central pair; and those of each lateral pair are seated contiguously to each other on a small black tubercular prominence, which, however, is very apparent when the Spider is looked at from the front; when looked at in profile the lateral eyes are placed considerably behind those on the occipital eminence.

The *legs* are moderately long, rather slender, of a dull pale orange-yellow colour, and furnished with short hairs.

The *palpi* are rather strong, moderately long, and similar to the legs in colour; the cubital joint is long, rather curved, and enlarges from its hinder to its fore extremity; the radial joint is very short, but is prolonged at its fore extremity into a long, curved, tapering, sharp-pointed apophysis; the digital joint is not very large, but of rather a peculiar form, having an angular prominence at its hinder part, near which is a short row of a few black curved bristles, more conspicuous than the rest of the hairs on the joint; the palpal organs are prominent and well developed, but not very complex, nor presenting any remarkable feature in structure.

The *falces* are small, similar in colour to the cephalothorax, and, owing to the prominence of the fore part of the caput, placed considerably backwards under it.

The *maxillæ* and *labium* are of normal character, and rather paler in colour than the falces.

The *sternum* is of ordinary size and form, similar to the cephalothorax in colour, and apparently covered with small punctures.

The *abdomen* is of a flattened oval form; the larger portion of the upper part is covered with a coriaceous punctuose epidermis, of a dark-yellow-brown colour, pretty thickly mottled with clearer yellow-brown; four more conspicuous spots of this colour form a quadrangular figure on the middle; and behind these are two rather oblique opposed short sinuous similarly coloured lines; the hinder part (which, as well as the sides, is black) has several very slightly angular pale lines or chevrons between the limits of the coriaceous epidermis and the spinners; and the sides are longitudinally wrinkled; the underside is black; the spiracular plates are orange-coloured and of large size.

the [illegible] [illegible] [illegible] [illegible] greater than usual; they are [illegible] [illegible] [illegible] [illegible] [illegible]

The [illegible] are [illegible] [illegible], but not very strong, and furnished with [illegible] [illegible] [illegible] is not very long, but longer than the [illegible] [illegible] [illegible] [illegible] and is [illegible] at its extremity, [illegible] [illegible] [illegible] [illegible] [illegible] a strong, moderately long, curved, [illegible] [illegible] [illegible] [illegible] [illegible] over the base of the [illegible] [illegible] [illegible] [illegible] [illegible] rather prominent behind; the [illegible] [illegible] is large [illegible] [illegible] [illegible] and the palpal organs are prominent, [illegible] [illegible] and [illegible] with [illegible] processes; and at their extremity is a [illegible] very long, [illegible] curved, sharp-pointed, [illegible] spine.

The [illegible] are not strong, but moderate in length, and divergent towards their extremities.

The *abdomen* is of a rather [illegible] form, and projects slightly over the base of the cephalothorax; it is not very convex above, and is thinly clothed with hairs.

An adult female accompanied the above male, and resembled it in colours and general appearance; but the position of the eyes differed, (though no more than is ordinarily the case with Spiders whose cephalothoraces in the male sex present abnormal developments), and the [illegible] [illegible] [illegible]. I am inclined to think that it is the female of the male here described. The genital aperture is, as usual, characteristic. Another example of the male was of a darker and richer colour, the cephalothorax, sternum, and femora of the legs being of a brightish red, and the abdomen quite black.

The examples above recorded were contained in the collection received from Mr. J. H. Emerton, by whom they were found—the two former (male and female) on a fence at Providence, R. I., the latter (male) under leaves at Cambridge, Mass., in December 1873.

This species belongs to the group containing *E. cuspidata* (Bl.), and is very distinct from either of its European forms.

ERIGONE INDIRECTA, sp. n. (Plate LV. fig. 10.)

Adult male, length 1[illegible] line.

In form and general structure this Spider is very nearly allied to the foregoing species (*E. directa*), the palpi and palpal organs also being very similar; but it may at once be distinguished by its larger size and the very decided differences of colouring, as well as by the eminence between the eyes being slightly more erect, though a little bent forwards and a little stouter; the apex of the caput also is rather larger and less drawn out; the summit of the eminence is furnished thickly with short bristles, arranged in two longitudinal rows directed away from each other, looking (when seen from the front) as if parted like hair on the human head; there are also some other bristles on the back of the eminence, directed backwards and rather downwards.

The whole of the caput, nearly as far back as the thoracic junction, is of a shining jet-black colour; the thorax bright orange-red; the *palpi*, *falces*, *maxillæ*, and *labium* are very dark, but not quite so black as the caput; the *sternum* is orange-red; the legs light yellow-brown, except the femora, which are also orange-red. The hairs on the palpi are more numerous and coarser than in *E. directa*.

The *eyes* are smaller than in *E. directa*, and indistinct, but are in the same position; the part of the cephalothorax near the occiput appears to be finely and transversely rugulose, or striated with fine scratch-like lines, visible only with a lens.

The *abdomen* is elongate-oval, not very convex above, but projecting a little over the base of the cephalothorax; it is of a pale buff-yellow colour, slightly tinged with brown.

The *female* resembles the male in colours and general characters; and the genital aperture, though bearing some resemblance to that of *E. directa*, is yet decidedly distinct.

Two adult males and five females of this Spider were contained in Mr. Emerton's collection; and all were as vividly and distinctly coloured as the example above described. This with the slight differences in form and structure above detailed convince me of its distinctness from *E. directa*. The strong contrast presented by the black and orange cephalothorax and legs with the pale abdomen make it very noticeable.

DESCRIPTION OF PLATE LV.

Fig. 1. *Erigone interpres*, ♂ & ♀, p. 430.
a, profile, with legs and palpi truncated; *b*, caput, from the front; *c*, left palpus, from outer side; *d*, *e*, right palpus, in two positions; *f*, genital aperture of female; *g*, natural length of male.

2. *Erigone probata*, ♂ & ♀, p. 431.
a, profile; *b*, caput and falces, from the front; *c*, right palpus, from above and behind; *d*, *e*, genital aperture of female, in two positions; *f*, natural length of male.

3. *Erigone spinifera*, ♂ & ♀, p. 432.
a, profile; *b*, caput and falces, from the front; *c*, left palpus, from outer side and rather in front; *d*, right palpus, from above and behind; *e*, cubital and radial joints of right palpus, from inside and in front; *f*, genital aperture of female; *g*, natural length.

4. *Erigone læta*, ♂ & ♀, p. 433.
a, profile; *b*, natural length; *c*, caput, from the front; *d*, right palpus, from outer side and rather underneath; *e*, ditto, from inner side in front; *f*, left palpus, from upperside in front; *g*, genital aperture of female.

5. *Erigone lætabilis*, ♂, p. 435.
a, right palpus, from inner side; *b*, ditto, further round; *c*, humeral, cubital, and radial joints of right palp, from outer side; *d*, natural length.

6. *Erigone emertoni*, ♂, p. 435.
a, profile; *b*, caput and falces, from front; *c*, right palpus, from inner side; *d*, ditto, from behind and above; *e*, natural length.

7. *Erigone atriceps*, ♂, p. 436.
a, profile; *b*, caput, from front; *c*, cephalothorax, from above; *d*, left palpus, from outer side; *e*, natural length.

8. *Erigone fissiceps*, ♂ & ♀, p. 438.
a, profile; *b*, fore part of cephalothorax, from above and behind; *c*, caput, from front; *d*, right palpus, from inner side in front; *e*, left ditto, from above and behind; *f*, natural length; *g*, genital aperture of female.

Fig. 1. [illegible] [illegible] ♂ & ♀, p. 439.
a, profile; b, caput, from the front; c, right palpus, from behind and above; d, radial, cubital, and (part of) humeral joints of ditto, from inner side; e, natural length; f, genital aperture of female.
2. [illegible] [illegible] ♂ & ♀, p. 440.
a, palpi; b, caput, from the front; c, natural length of male; d, genital aperture of female.

5. Descriptions of some new or imperfectly known Species of Reptiles from the Camaroon Mountains. By Dr. Albert Günther, V.P.Z.S.

[Received June 9, 1874.]

(Plates LVI. & LVII.)

Mr. Higgins has just received from one of his correspondents a small but singularly interesting collection of reptiles made in a part of the Camaroon Mountains whence evidently no collection had previously reached England. It contained only eleven species, viz. *Calabaria fusca*, *Typhlops eschrichtii*, *Dipsas valida*, *Lycophidium irroratum*, *Chamæleon cristatus*, *Lisurus ornatus*, and *Hylambates palmatus*, and four others previously not known to me, which are distinguished by a most extraordinary combination of characters, as will be seen from the following descriptions.

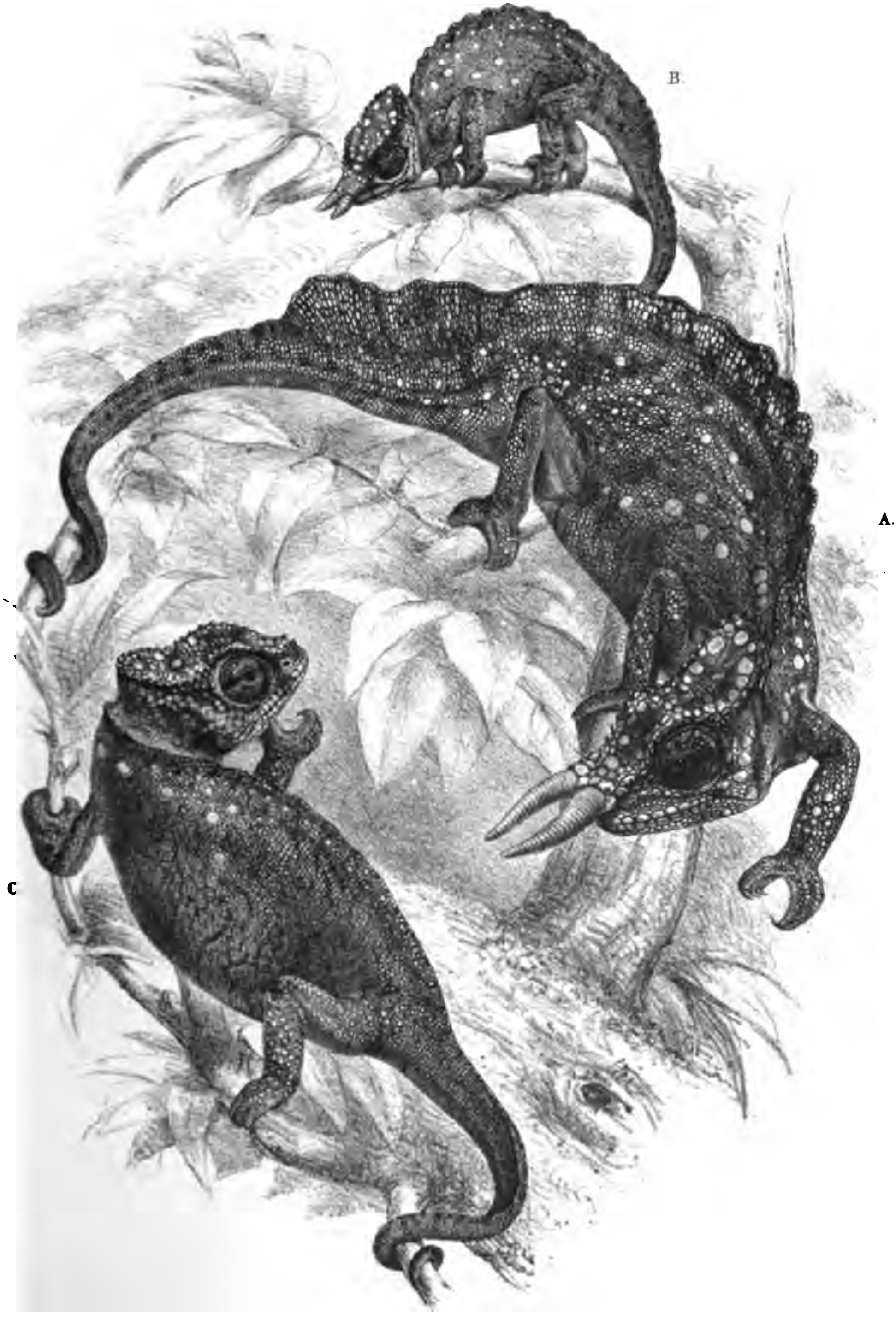
CHAMÆLEON MONTIUM. (Plate LVI.)

Chamæleo montium, Buchholz, Berlin. MB. 1874, p. 88, figs. 1–4 (head).

Adult male with two nearly straight pointed horns, horizontally projecting forwards from above the nostrils; the sheath in which they are encased is finely annulated, and the horns themselves are about half as long as the head. The occiput is quite flat, with a semielliptical or semioval outline, and without lateral lobes. The superciliary edge is slightly raised, the forehead being rather concave. A high crest, supported by the neural spines of the vertebræ, runs along the whole length of the back, and is, without interruption, continued over the anterior third of the tail, at the end of which it abruptly ceases. Its upper margin is slightly scolloped, except in the middle third of its length. Its highest portion is that on the tail. The upper part of the head is covered with small, irregular, polygonal scutes; and other round scutes of about the same size are scattered over the sides of the body, and are more numerous on the throat, where they are sometimes conically raised. No line of compressed scales along the middle of the belly.

A *young male*, scarcely more than 2 inches long without the tail, has the horns already well-developed, about as long as the orbit, and a distinct indication of the crest.

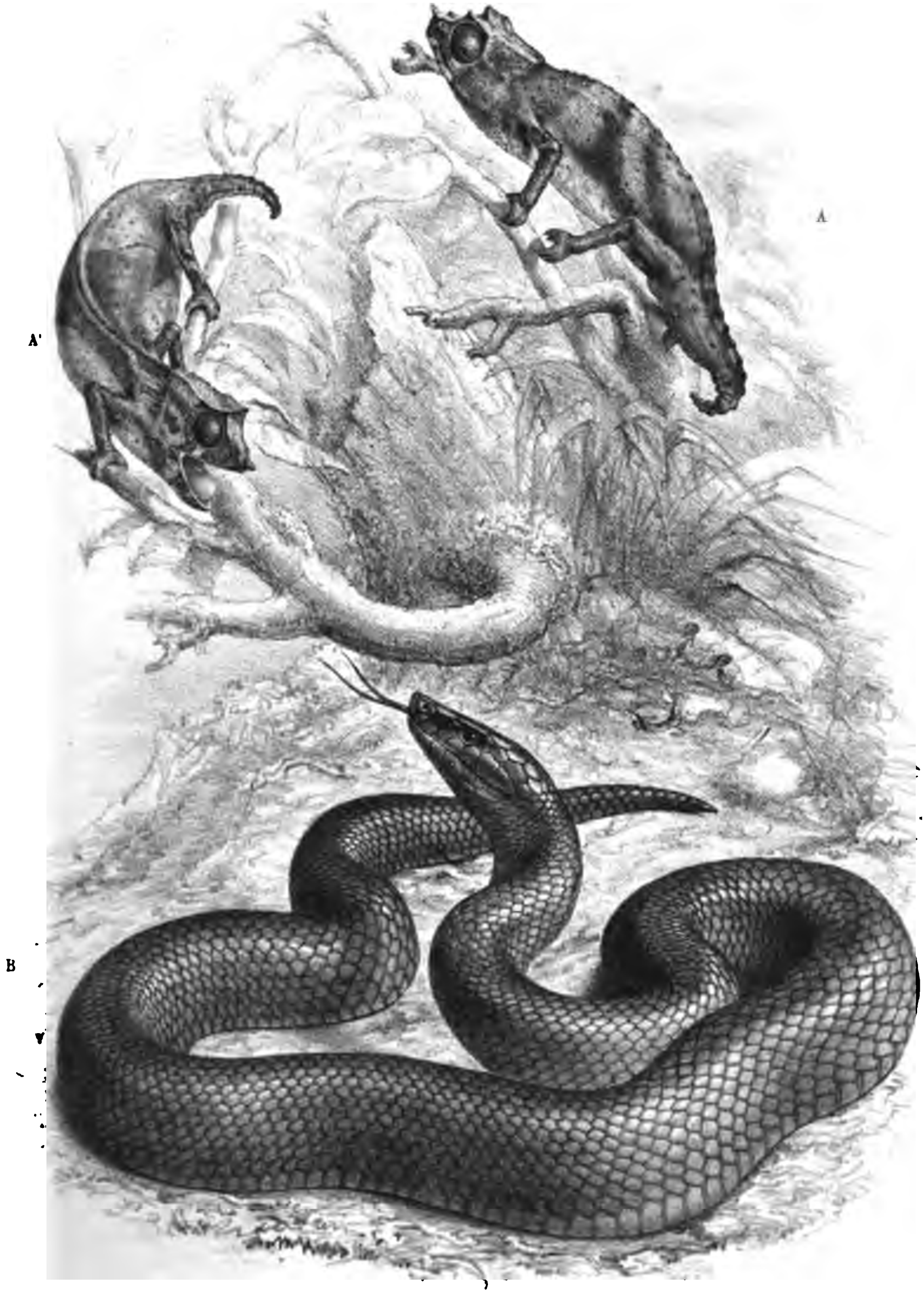
In the *adult female* the two frontal horns are reduced to two conical prominences, and the occiput is much less produced backwards. No dorsal crest.



G H Ford

Mintern Bros imp

CHAMÆLEON MONTIUM
Fig A ♂ ADULT. B ♂ JR C ♀.



G H Ford

Mintern Bros imp

A ♂. A' ♀. RAMPHOLEON SPECTRUM.
B BOTHROLYCUS ATER

The colour is a mixture of yellow, greenish, and black; the first predominates on the body, the second on the legs and tail, and the last on the head.

The largest specimen of this very extraordinary species is 9 inches, of which the tail takes 4 inches.

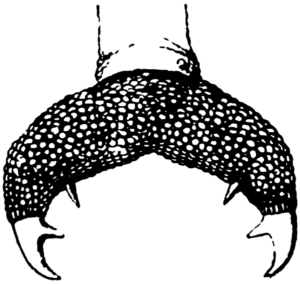
RHAMPHOLEON SPECTRUM. (Plate LVII. figs. A, A′.)

*Chamæleo superciliaris**, Buchholz, Berlin. MB. 1874, p. 81 (*nec* Kuhl).

Chamæleo spectrum, Buchholz, *l. c.* p. 298, figs. 5 & 6.

The tail of this species is unusually short, being only one third of the total length in the male and one fourth in the female. It is very much thickened for two thirds of its length in the male, leaving only the terminal third prehensile. Otherwise there is no difference between the sexes, both sexes having a very short, soft, granulated, rostral appendage. The eyebrows are produced into a short, triangular, flexible, horn-like prominence, the two horns being connected by a transverse ridge which crosses the concave forehead. No dorsal crest, which is replaced by a series of very small tubercles, each formed by a group of enlarged granules, these prominences being more distinct on the tail than on the trunk. Occiput without prominent ridge or lobe; body covered with extremely small granules, a few of which are somewhat larger than the others. In the female the throat and lower side of the tail are provided with rather numerous conical tubercles.

The tail is so short that it can serve as a prehensile organ in a very subordinate manner only. This defect is compensated by the development of an additional sharp denticle at the inner base of each claw, and of a spine vertically projecting from the flexor side of each finger and toe, which must immensely strengthen the power of the



Profile of left fore foot of *Rampholeon spectrum.*

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* *Chamæleon superciliaris* is confined to Madagascar; two of the three specimens in the British Museum are from that island; the locality of the third (typical) specimen is not known. Three weeks after the present communication had been sent to the Society, I received through the kindness of Prof. Peters an early separate copy of Dr. Buchholz's second paper on these Chameleons, in which, however, only the superficial characters of this interesting form are noticed.

animal for holding on to branches, &c. This modification of structure appears to me to be sufficient for separating this species in a distinct genus, for which the name *Rhampholeon* may be proposed.

One male and two females, all adult, are in the collection. Male 23 lines long, tail 13 lines; female 35 lines long, tail 9 lines.

BOTHROLYCUS (g. n. Lycodont.).

Habit stout; head rather short, depressed, with an obliquely truncated snout; tail short. A deep pit in the loreal region. Scales smooth, in nineteen rows. Anal entire; subcaudals biserial. Pupil round. The anterior teeth of the maxillary row considerably larger than the succeeding, from which they are separated by a short interspace.

A most singular genus, combining the family characters of a *Lycodon* with the peculiar præocular pit of the Colubrine genus *Bothrophthalmus*, which is also one of the most characteristic forms of the West-African fauna. It is a very remarkable fact that this pit is found in venomous as well as non-venomous Snakes, the Asiatic and American Ophidians provided with it belonging to the family Crotalidæ, whilst those from tropical Africa are Colubrine and Lycodont forms.

BOTHROLYCUS ATER. (Plate LVII. fig. B.)

The form of the head reminds us of that of *Halys*, the rostral and loreal margins being angular. The rostral shield does not extend to the upper surface of the snout. Anterior frontals broader than long, half the size of posterior. Superciliaries as large as vertical; occipitals short. Nostril small, between two nasals. Loreal entirely sunk into the elongate pit which extends into the orbit, the single præocular being visible only as a linear shield above the pit. Seven upper labials, the fourth and fifth entering the orbit. Two small postoculars. Temporals 1 + 2, the upper of the second series being situated behind the occipital and large, twice the size of the lower. Median lower labial longer than broad. Scales perfectly smooth, none of the middle rows enlarged, in nineteen series. Ventrals without ridge, 147 in number. Subcaudals 22 pairs.

Uniform black above, blackish brown below. On some of the labial shields a minute yellowish speck edged with darker. Similar very small and indistinct spots on the ventrals.

Total length 18 inches, the tail being 1½ inch.

LYCOPHIDIUM ELAPOIDES.

The single specimen in the collection is in a bad state of preservation, especially the head, which had been partially dried. However, the scutellation appears to have been very similar to that of *L. irroratum*, of which species two examples were in the collection. Scales in seventeen rows. Ventrals 225; subcaudals 72 pairs. Body and tail annulated with alternate white and black rings of equal width, but with somewhat irregular outlines; there are twenty-five black rings on the body and nine on the tail. The head is nearly entirely black. The rings on the body do not extend across the ventrals, which are white, and, like the white interspaces between the black rings, irregularly spotted with black.

This is a slender species with narrow head, and with the body somewhat compressed. Total length 15 inches, the tail being 4 inches.

6. Descriptions of three new Species of the Genus *Synallaxis*.

By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received June 9, 1874.]

(Plate LVIII.)

Among the birdskins collected by M. Jelski in Central Peru, and lately submitted to my examination by our Corresponding Member M. Taczanowski, of Warsaw, are specimens of four species of Synallaxine birds which had not occurred in his previous collections, and were therefore not included in my synopsis of the genus, published in the first part of the Society's 'Proceedings' for the present year. What is still more remarkable is, that three of these species (all referable to the *Synallaxis* proper according to my views) appear to be new to science. Certainly they cannot be referred to any of the fifty-eight species which I have described in the above-mentioned memoir. The fourth is *Leptasthenura andicola* (Sclater, P. Z. S. 1869, p. 636, pl. xlix. fig. 2), which I had not met with previously in Peruvian collections, although its occurrence there was by no means unlikely from its having been obtained at a high elevation in the Andes in the neighbouring republic of Ecuador.

Of the three new species of *Synallaxis*, with M. Taczanowski's kind sanction, I proceed to offer the following descriptions.

1. **Synallaxis pudibunda**, sp. nov. (Plate LVIII. fig. 1.)

Supra murino-brunnea, in dorso inferiore rufescens; alis et cauda luride rufis, hujus rectricibus quatuor mediis in pogonio interiore nigricantibus: superciliis indistinctis, capitis lateribus et corpore toto subtus cineraceo-fuscis; gula media pallide fulva, punctis indistinctis nigris circumdata: hypochondriis et crisso rufescente lavatis: subalaribus et remigum marginibus internis rufis: rostro obscure corneo, mandibula inferiore ad basin albicante, pedibus obscure corylinis: long. tota 5·8, *alæ* 2·1, *caudæ rectr. med.* 2·9, *rectr ext.* 1·7.

Hab. Obraillo, Peru (*Jelski*).

Mus. Varsoviano.

There is but one specimen of this species, which, however, seems quite distinct from any of those that I am acquainted with. It belongs to the section with twelve rectrices, and will stand best, I think, near *S. modesta* and its allies, having a pale fawn-coloured gular patch, round which, on the sides of the face and neck, are indistinct blackish freckles. There is a pale superciliary stripe, but very indistinct. The wings externally and the tail are of a nearly uniform darkish rufous, with the exception of the apical portion of the inner webs of the two middle pairs of rectrices, which are blackish.

2. SYNALLAXIS GRAMINICOLA, sp. nov. (Plate LVIII. fig. 2.)

Synallaxis graminicola, Jelski, MS.

Supra fusca nigro striata; subtus pallide fulva, macula gulæ quadrata rufa: remigibus omnibus rufo-castaneis, secundariis dorso proximis et ceterorum parte apicali fusco-nigris; alarum tectricibus extus fulvescenti-rufis; subalaribus et remigum marginibus internis pure rufis: caudæ rectricibus tribus utrinque externis castaneis, ceteris præcipue in pogonio externo fusco variegatis, mediis duabus acuminatis et in utroque pogonio fuscis; rectricum omnium scapis nigris: rostro corylino, mandibula inferiore ad basin albicante, pedibus carneis: long. tota 6·8, *alæ* 2·9, *caudæ rectr. med.* 3·5, *ext.* 2.

Hab. Junin, Central Peru (*Jelski*).

Mus. Varsoviano.

Obs. Sp. *S. wyatti*, ex Columbia, affinis, sed macula gulæ rufa, pectore fulvo et alis caudaque longioribus distinguenda.

This is certainly a close ally of *S. wyatti*, established in 1870 upon a single skin obtained by Mr. Wyatt on the Paramo of Pamplona, in Columbia, but appears to be a larger, finer bird, of a nearly uniform rich cinnamomeous below, and with a distinct red gular spot as in *S. anthoides*.

3. SYNALLAXIS VIRGATA, sp. nov.

Synallaxis virgata ?, Jelski, MS.

Supra fusca nigro variegata et a fronte usque ad dorsum medium striis longitudinalibus albis in capite rufescentibus ornata: subtus alba, gula media flavicanti-rufa; hypchondriis et ventre imo pallide fuscis, albo obsolete striolatis: alis fusco-nigris; remigibus in pogonio interno ad basin rufis, necnon extus rufo limbatis; subalaribus cinnamomeo-rufis: cauda fusco-nigra remigibus externis rufescente variegatis: rostro elongato cærulescenti-corneo; pedibus obscure plumbeis: long. tota 7·4, *alæ* 2·9, *caudæ rectr. med.* 3·8, *ext.* 2·0, *rostri a rictu* 0·85.

Hab. Junin, Central Peru (*Jelski*).

Mus. Varsoviano.

Obs. Proxima *S. flammulatæ*, sed crassitie majore, dorso inferiore non striato et pectore medio albo diversa.

This larger form of *S. flammulata* is readily distinguishable by the points above mentioned, and is, as far as I can tell from the single specimen obtained by M. Jelski, an excellent species.

Adding, then, three species to those previously sent by M. Jelski, we find that no less than ten *Synallaxes* occur in this district of Peru, namely :—

1. *S. frontalis*, syn. of *Synallaxes*, anteà, p. 8.
2. *S. brunneicauda*, anteà, p. 8.

3. *S. palpebralis*, anteà, p. 16.
4. *S. curtata*, anteà, p. 19.
5. *S. albicapilla*, anteà, p. 22.
6. *S. pudibunda*, suprà, p. 445.
7. *S. humilis*, anteà, p. 23.
8. *S. graminicola*, suprà, p. 446.
9. *S. virgata*, suprà, p, 446.
10. *S. flammulata*, anteà, p. 26.

7. On a Living Dodo shipped for England in the Year 1628.

By Alfred Newton, M.A., F.R.S., F.Z.S.

[Received June 12, 1874.]

Having had the satisfaction, at the meeting of this Society on the 19th of May last, of exhibiting to the Members then present two original letters mentioning a Dodo (*Didus ineptus*) sent to this country by the writer of them in the year 1628, I now offer a few remarks thereon; for the short time they had been in my possession hardly allowed me then to ascertain the chief points of interest to be derived from them.

The two letters were lent to me by their custodian, John Bramston Wilmot, Esq., M.D., of Tunbridge Wells. Early in the present year a notice of the Dodo by Mr. Tegetmeier, F.Z.S. (with a woodcut from the picture formerly belonging to the late Mr. Broderip, and now in the Society's keeping*), appeared in the 'Field' newspaper. This attracted Dr. Wilmot's attention; and he immediately communicated to that useful periodical a short extract from one of these letters, which, however, was very inaccurately printed†. On reading this I at once wrote to Dr. Wilmot, who has most kindly done all in his power to gratify my wishes on the subject.

The writer of the letters was Emanuel Altham, younger brother of Sir Edward Altham, Kt., of Marke Hall, in Essex, to whom they are addressed. Emanuel sailed from England in the spring of 1626, to the East Indies, on board the 'Hopewell,' in company with five other ships, one or more of which undoubtedly bore the ambassadors, Sir Dodmore Cotton and Sir Robert Sherley, whom Charles I. was sending to the "Pot-shaugh" of Persia, and, in their retinue, Sir Thomas Herbert, whose figure and descriptions of the Dodo are well known‡. The fleet anchored in Swalley road, off Surat, on the 30th of November in that year; and soon after, the voyagers separated —Herbert going, in the ship 'William,' to Gombroon in the Persian Gulf§. It is no easy matter to glean the dates of the various incidents recorded in his book; but it is almost certain that he could not have reached Mauritius until 1629[*], while Altham, as the letters show, was there in 1628. For the time that the two travellers were in company, however, their tales tally very well. Both mention the mortality which the expedition suffered in the Mozambique Channel, losing the Vice-Admiral, Goodall, "and many a braue gentleman beside;" both were equally struck with the amazing whiteness of the sea (a phenomenon often observed since); and both frequently name the same ships as forming part of the fleet. These facts appear equally in others of Altham's letters (a copy of which has been considerately placed in my hands by Dr. Wilmot) and in Herbert's published 'Travels.'

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* Trans. Zool. Soc. iv. p. 186, pl. 54.

† 'Field,' xliii. p. 177, No. 1104, Feb. 21, 1874.

‡ See Strickland 'The Dodo' &c., pp. 19, 20.

§ Herbert's 'Travels' &c., 2nd ed. 1638, p. 110; 3rd ed. 1665, p. 107; 4th ed. 1677, p. 102.

To come, however, to the two letters which I exhibited. They bear the same date, and were doubtless written to be sent by different hands. Both (as before stated) are addressed to the same person, and begin:—

"Right wo^{r} and louinge brother."

The first and longest, after recounting the writer's adventures, proceeds:—

"We were ordered by y^{e} said Councell [of India] to goe to an Iland called y^{e} mauritius lying in 20^{d} of South latt where wee arriued y^{e} 28th of may: this Iland hauinge many goates hogs and cowes upon it and very strange fowles called by y^{e} portingals DoDo which for the rareness of the same the like beinge not in y^{e} world but here I have sent you one by m^{r} perce: who did arriue with y^{e} ship william at this Iland y^{e} 10th of June."

It concludes:—

"your most louinge brother
EMANUELL ALTHAM./"

"June y^{e} 18th 1628
ffrō y^{e} mauritius."

And there is a postscript, written across the margin, as follows:—

"of m^{r} perce you shall receue a iarr of ginger for my sister: some beades for my Cosins your daughters: and a bird called a DoDo./ if it liue"

Its superscription is:—

"To y^{e} right woo^{r} my most Louinge brother S^{r} Edward Altham at marke Hall, in Essex./

"Deliuer./"

The second letter ends thus:—

"You shall receue a iarr of India ginger for my sister your wife as alsoe some beades for my Cosins your daughters, and withall a strange fowle: which I had at the Iland mauritius called by y^{e} portingalls a DoDo: which for the rareness thereof I hope wilbe welcome to you.

"mauritius y^{e} 18th of June 1628: your most louing brother,
EMANUELL ALTHAM./"

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[*] Strickland, however, says (*l. c.*) "1627."

This letter is superscribed:—

"To yᵉ right wooʳ my most Louinge brother Sʳ Edward Altham Dwelling at marke hall in Essex

"Per a frend whome god preserue.

"Leaue this at one william watson's House in yᵉ minories a gunsmith to be sente as aboue saide./"

As to the genuineness of these letters there can be no suspicion. Dr. Wilmot tells me that they form part of a correspondence between various members of the Altham family which a few years ago came into his charge as executor to the will of a lady connected with that family, that they have doubtless been always in safe keeping, and that they have never been in the hands of a dealer. The two letters mentioning the Dodo have been shown by me to my friend Mr. Bradshaw, the Librarian of the University of Cambridge, well known as a skilful palæographer, who, from the evidence of the handwriting, paper, and other *indicia*, chiefly appreciated by experts, declares them to be of the period to which their dates assign them.

Whether this Dodo reached England alive there is nothing to show. The only letter in the correspondence from Edward Altham to Emanuel is dated 3 January, 1628, or six months before the bird was shipped from Mauritius. Emanuel died in the fort of Armagon, on the coast of Coromandel, in 1635, having, in his last illness, had "all his p'ticular bookes of accompts and many other wrightings" burnt in his presence, as testified by a document to that effect, signed by four witnesses and now in the collection. I cannot find the name of Altham among the "Principall Benefactors" to the 'Musæum Tradescantianum' (1656), where Herbert's name, on the contrary, does occur; but, as is well known, Sir Hamon Le Strange saw a live Dodo exhibited in London about 1638, and by 1634 a specimen had been given to the Anatomy School at Oxford*.

8. On the Lapwing of Chili.

By J. E. Harting, F.L.S., F.Z.S.

[Received June 15, 1874.]

During the past few months a considerable number of specimens of the Lapwing of Chili, chiefly collected by Mr. Reed, have passed through my hands; and a tolerably good series is now before me.

On comparing these specimens with others from different localities on the eastern side of South America, as Cayenne, Bahia, and Rio, a marked difference is observable between them in point of size, the western bird being so very much larger and more robust than the eastern form.

Vanellus cayennensis, Gmelin, from Cayenne, was described by him as "*Vanello minor*;" and if it is not invariably less than *Vanellus cristatus*, with which he compared it, the specimens which I have seen from the above-named eastern localities seem to justify the observation that it is never larger. Now the bird from Chili, which is found also in Patagonia, and, I believe, in the Falkland Islands, is always considerably larger than *V. cristatus* and *à fortiori* than *V. cayennensis*. Size, however, is not the only respect in which it differs from the last-named. It will be seen on comparison that the black colour of the forehead extends further back, and encroaches more upon the cheeks; the same colour upon the chin (which in *V. cayennensis* is restricted to a small patch between the rami of the lower mandible, very faintly edged with white, and passing into a mere streak which almost disappears before it reaches the black of the breast) has in the western bird the appearance of one broad patch of equal width, extending from the base and beyond the rami of the under mandible quite down to the black of the breast, into which it merges. This broad patch is very conspicuously edged with a white line, which extends from the black breast-plate upwards in front of the eye and over the crown, and so downwards on the other side, separating conspicuously the black forehead and throat from the grey of the crown, nape, and sides of the neck.

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* Ann. & Mag. Nat. Hist. (ser. 2) iii. pp. 136, 137.

The crown, nape, and sides of the head and neck in *V. cayennensis* are brown (or, perhaps, it would be more correct to say greyish brown), instead of pearl-grey as in the other; and, to judge by the specimens which I have examined, *V. cayennensis* always has a well-developed occipital crest of black feathers, while in the other the crest is not only more scanty in appearance, but the few feathers of which it is composed are grey rather than black. In this respect it approaches *Vanellus resplendens*, Tschudi (*V. ptiloscceles*, Gray), from the Peruvian Andes, which is not crested.

It may be suggested that the crest is only an adornment during the breeding-season, like the frill of *Machetes pugnax*; but if so, this is contrary to what occurs in the case of *Vanellus cristatus*, and, moreover, most of the specimens forwarded from Chili were procured at a time when the birds must have had eggs or young.

In addition to this, the tibia is feathered much lower down than in *V. cayennensis*, the tarsus is proportionally shorter and more robust, the toes proportionally shorter and less attenuated.

On account of these and other less-marked differences, it appears to me that the western may be readily separated from the eastern form; and I propose to distinguish it accordingly as *Vanellus occidentalis*.

The synonymy, habitat*, and diagnosis of the two species stand as follows:—

VANELLUS CAYENNENSIS (Gmelin).

Parra cayennensis, Gmelin, Syst. Nat. i. p. 706 (1788).

Tringa cayennensis, Latham, Ind. Orn. ii. p. 727 (1790); id. Gen. Hist. ix. p. 300 (1824).

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* For the present, the habitat given in each case must be considered to be only provisional, until the geographical distribution of the two becomes better known.

Charadrius lampronotus, Wagler, Syst. Av. *Charad.* n. 48 (1827).

Vanellus cayennensis, Schlegel (part.), Mus. P.-B. *Cursor.* p. 57 (1865); Sclater, P. Z. S. 1867, p. 591.

Hab. Venezuela, Guiana, Amazonas, Brazil, Uruguay, Buenos Ayres.

Diagn. V. *fronte et gula nigris; stria angusta a mento ad pectus nigra ducta; verticis medio brunneo; cervice albida; occipitis fusci crista nigricante; regione parotica et colli lateribus brunneis; dorso virescenti-purpureo; tectricibus alarum exterioribus albis, primariis nigris; spinis alarum carnosis; pectoris fascia lata nigra; abdomine crissoque albis; cauda a basi ad medium alba, altera parte nigra, apicis margine albo. Rostro rubro, apice nigro; pedibus rubescentibus.*

Long. tot. 11·5-12 poll., rostr. 1·2, alæ 8·5, tib. nud. 1–1·3; tars. 2·75–2·9, dig. med. 1·4.

VANELLUS OCCIDENTALIS, mihi.

Parra chilensis, Molina, Saggio sulla Stor. Nat. del Chili, p. 205 (1810).

Vanellus cayennensis, Bridges, P. Z. S. 1841, p. 94, 1843, p. 117; Gay, Faun. Chil. i. p. 400 (1847); Cassin, Gillis's Expl. Exped. p. 195 (1855); Schlegel (part.), Mus. P.-B. *Curs.* p. 57 (1865).

Vanellus chiliensis, Yarrell, P. Z. S. 1847, p. 54.

Hab. Chili, Patagonia, Falkland I. (?).

Diagn. *Similis* V. cayennensi *sed major; occipite subcristato; tibiæ plumis longioribus, tarsis pedibusque robustioribus. Fronte et gula nigris; stria lata a mento ad pectus nigra ducta, linea alba marginata; verticis medio cinereo; cervice albida; regione parotica et colli lateribus cinereis; dorso virescenti-purpureo; tectricibus alarum exterioribus albis, primariis nigris; spinis alarum flavicantibus; pectoris fascia lata nigra; abdomine crissoque albis; cauda a basi ad medium alba, altera parte nigra, apicis margine albo. Rostro rubro, apice nigro; pedibus rubescentibus.*

Long. tot. 15–15·5 poll., rostr. 1·2–1·3, alæ 9·7–9·9, tib. nud. ·6–·7, tars. 2·8–2·9, dig. med. 1·4–1·5.

If the habits ascribed by Molina to his *Parra chilensis* are those of the present species, as seems probable, his account of the bird is the fullest which has appeared. It is not altogether free from doubt, however; for Molina's bird is described as having a small fleshy protuberance on the forehead, a peculiarity which is not observable in the present species. Translated from the Italian his description runs somewhat as follows:—

"This bird being well armed defends itself with spirit against all animals, and repulses them by striking at them furiously with its spurs. Notwithstanding that its toes are well divided, it never perches on trees or dwells in elevated spots, but is always found in the plains, where it feeds on worms and insects. It nests amongst the herbage, and lays only three eggs, rather larger than Partridges' eggs, of a dusky colour variegated with black, and better-flavoured than hen's eggs."

"The male and female always keep together; and one rarely sees them in flocks. When they perceive that any one is looking for their eggs, they quietly retire as far as they can from the nest, squatting down on the grass, nor do they show themselves except at a distance and without manifesting the least alarm; but should they see the intruder approaching their cherished brood, they rise upon the wing and dart down at him with the greatest fury.

"This trait (which they share in common with the Lapwing) and the other above-mentioned peculiarities, or characteristics, at first induced me to place it in the same genus, calling it *Tringa chilensis*; but the small fleshy protuberance on the forehead* compelled me to leave it in the genus *Parra*, from which, however, it differs by the moderate size of its toes.

"It has been observed that these birds never call out at night except when they hear some one pass. On this account the Araucanians make use of them in time of war, as so many sentinels on the alert to give warning against a surprise of the enemy.

"In times gone by the gentry of the country amused themselves by hawking at these birds with trained Falcons; but now they shoot them with guns.

"Their flesh is not inferior to that of the Woodcock."

A similar account is given more briefly by Gay in his 'Fauna Chilena,' vol. i. p. 400; and Bridges (*l. s. c.*) has not added much more to the history of the bird. He describes it as "one of the most common birds found on the plains near the Andes and in other parts of the country," and found its food to consist of worms, locusts, &c. The eggs he described as excellent eating and resembling those of the Lapwing of England, *Vanellus cristatus*—a description which was subsequently confirmed by Yarrell, who gave a more detailed account of their size, colour, and appearance (P. Z. S. 1847, p. 54) from specimens which had been forwarded to him from Chili.

9. On a Small, Tufted, Hornless Deer from the Mountains near Ningpo. By R. SWINHOE.

[Received June 16, 1874.]

(Plate LIX.)

My friend and correspondent Mr. A. Michie wrote me a letter, dated Shanghai, December 19, 1873, as follows:—"I send another note to overtake the mail, to tell you I have just found a new deer from the Ningpo country. It is a dark iron-grey or pepper-and-salt colour, like some Scotch terriers, with white tips to its ears, square-built (that is, straight back and pointed hip), with very short tail. On its forehead is a thick black mane like the bristles of a boar. The skull has, unfortunately, got smashed—the people say by the struggles of the animal (they caught it alive); but I will send you as much of the skin and skeleton as I can. It has the lachrymal sinus, but not so large as the Muntjacs; in size the beast about equals the Muntjac. When I say this is a *new* deer, I only mean it is new to me, though it may be familiar to you."

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* This was a mistake on the part of Molina. No such protuberance is observable in the birds before me.

In due course the skin came home, but not a fragment of the skull. I drew Mr. Sclater's attention to the animal; and he said it might possibly be the *Elaphodus cephalophus* lately described by Alphonse Milne-Edwards from specimens sent by Père David from Moupin. This gentleman, to whom I wrote on the subject, very kindly sent me a copy of the coloured plate of the female with head of the male, and one of the plates of the male skull intended to illustrate his outcoming work 'Recherches pour servir à l'Hist. Nat. des Mammifères.'

In his later letters Mr. Michie informs me that his animal is known to the natives as the "*Shanyang*," or wild goat, that it was reported to him that the specimen was a female, and that on his describing it to Père David, who came soon after to Shanghai, the worthy priest said that he had procured the same species in the mountains of the north-west. Mr. Michie sent a photograph of the animal, taken while still fresh.

A short description of the *Elaphodus cephalophus* is given, with the initials A. M.-E., in a note at the foot of Père David's list of Chinese Mammals, in the 'Nouv. Arch. du Mus.' Bull. p. 93. With this Mr. Michie's animal agrees except as regards horns. David's animal had, according to this note, "cornes d'un pouce de long." Michie's specimen has none; and the skin shows no sign of any. It agrees in colour with the description, and thus differs notably from the drawing of the female, which is coloured chestnut-red, and has scarcely any of the bristly crest, a very conspicuous character in our specimen. It also lacks the canine teeth; Michie's skin bears marks of teeth on the lips—though, as the skull is unfortunately away, no teeth are in place. It has also other indications of the male sex; and for the present I think we may be justified in taking to ourselves the benefit of the doubt, and accept this animal as a new form, for which I would propose the name

LOPHOTRAGUS MICHIANUS, nov. gen. et. spec. (Plate LIX.)

I cannot, unfortunately, give any cranial characters, not a vestige of the skull, as I have said before, being left within the skin. Coat consisting of coarse thick hair, which gives the animal a very *goat*-like appearance; it has no indications of horns; but a thick tuft of coarse hair springs from the forehead, about 2 inches long, and lies back between base of ears. The lachrymal slit is about ·8 inch long; and the nostrils are confluent with the upper lip. Its chin abounds with long bristly hair; its hoofs are rather long and blackish.

General colour light blackish brown, darker on forehead, frontal tuft, back of ear, and along back; quite black on legs.

Underparts rather lighter-coloured, pure white on under tail, between thighs, and on tips, inside, and base of ears, their inner surface being crossed by a bar of blackish; the upper lip with a whitish line above it, and the lower with whitish just below it.

Mr. Keuleman's drawing gives a very good idea of this animal, which measures about 21 inches in height.

10. On the Eggs of some little-known *Limicolæ*. By J. E. Harting, F.L.S., F.Z.S.

[Received June 16, 1874.]

(Plate LX.)

The great assistance which may be derived in determining the natural affinities of birds by a study of comparative oology has been ably exposed by M. des Murs. No apology, therefore, seems to be needed for the following brief remarks on the eggs of some little-known wading-birds in the collection of the writer. It may be observed, however, that, for want of a recognized standard of colours amongst ornithologists, it is extremely difficult to describe an egg properly, or in such a manner even as to render its identification easy. For this reason, it seems better to appeal to the eye, at once, by means of a coloured representation, rather than to attempt a description which might defeat the object in view. I have accordingly confined my remarks to a description of the breeding-haunts, number of eggs laid, and other details of a like nature, leaving the coloured figures of such as are represented to speak for themselves.

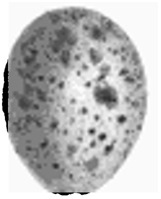
GLAREOLA MELANOPTERA, Nordm.

Pallas described this bird (which he took for *G. pratincola*) as very common between spring and autumn in the deserts of Tartary from the Volga to the Irtish. It has since been ascertained to have a much more extensive range, being found not only in Southern Russia, Turkey in Asia, Persia, and Arabia, but also throughout a considerable portion of the African continent, even to the west coast, specimens having been received from the Gaboon, Princes Island, and Damaraland. It is found also at the Cape.

I have received the egg from Southern Russia through Herr Möschler, but without any indication, unfortunately, of the precise locality where it was taken. It resembles the egg of *Glareola pratincola*; but the ground-colour is clearer and less suffused with spots and blotches.

TEREKIA CINEREA (Güldenst.).

Several eggs of this bird were taken by Messrs. Alston and Harvie Brown on the Dwina, near Archangel, in June 1872 (*cf.* Ibis, 1873,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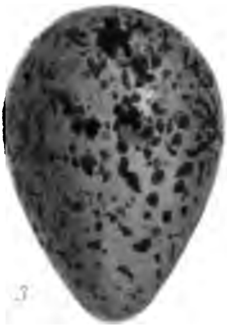
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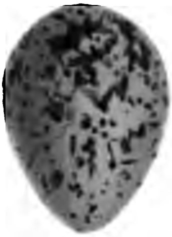
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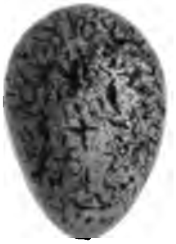
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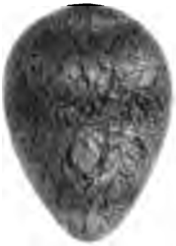
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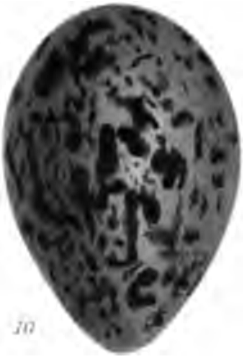
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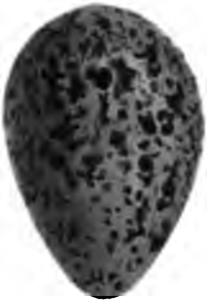
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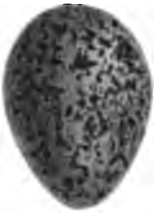
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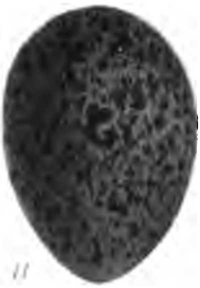
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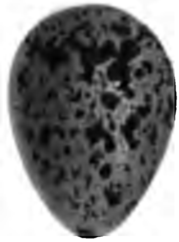
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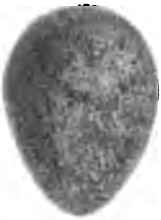
9

J. Smit lith.

M & N Hanhart imp.

EGGS OF RARE LIMICOLAE.

p. 68), some of which have been kindly presented to me. The finders describe the nest as a slight saucer-shaped hollow in the ground, lined with chips of wood and bits of thick reed, and placed in open marshy parts of the alder thickets by the sides of "hourias," or creeks, or in the sand amongst bent-grass. The eggs were found between the 15th June and the end of that month. They add, "the eggs in many instances closely resemble those of *Actitis hypoleuca*, but are a little larger. They bear no resemblance whatever to the eggs of *Limosæ*; indeed all this bird's habits, motions, cry, and quick darting erratic flight show its affinities with the Sandpipers and not with the Godwits."

GLAREOLA LACTEA, Temm. (Plate LX. fig. 1.)

The small Swallow Plover, as it is called by Anglo-Indians, is generally distributed throughout India, Nepal, Upper Burmah, and Tenasserim, but not in China or the Malay archipelago. Jerdon found it breeding at Thyetmyo in Upper Burmah, in May, when the young were just flown; and Mr. Brooks, C.E., found nests in a large sandy churr near Mirzapore. The egg here figured was procured with another by Dr. A. Anderson at Futtehgurh in April 1873. He reports that this species never lays more than two eggs at a time; and the parent birds are described as endeavouring to entice away the intruder from their nests just like a Plover.

LOBIVANELLUS GOENSIS (Gmelin).

This is a common species enough in India; but the egg does not appear to be well known. It resembles the egg of *Vanellus cristatus*, but is less pyriform, and the ground-colour is paler.

The bird breeds in June or July, on rushy sand islets on large rivers, or on bushy downs inland. The eggs are laid on the bare ground, without any attempt at a nest, but are often concealed amid grass or under a thicket, although more frequently exposed to view. The specimen here figured is one from a nest of four taken at Futtehgurh on the 27th April, 1873, and forwarded by Dr. A. Anderson.

HOPLOPTERUS VENTRALIS (Wagler). (Plate LX. fig. 3.)

The Indian Spur-winged Plover is reported to be generally distributed throughout India, Burmah, Arracan, and Tenasserim, down as far as Singapore; and Mr. Swinhoe has recorded it from Hainan, although it is not found in China. It breeds at the close of the cold weather, when the rivers are at their lowest, laying its eggs (generally four in number) on the bare sand, and always on an islet. The example now figured for the first time was forwarded from Futtehgurh by Dr. A. Anderson.

ESACUS RECURVIROSTRIS (Cuvier).

The handsome egg here referred to was sent home by the late Lieut. Beavan as an egg of this species; but unfortunately the particulars of locality, date, &c. have been either lost or mislaid. That it really is the egg of *Esacus recurvirostris* there can be no doubt, since its size, shape, and peculiar coloration preclude its belonging to any other species inhabiting India. It resembles in some respects the egg of *Œdicnemus crepitans*, but is larger, the ground-colour of a warmer tint, and the surface more richly blotched. Thienemann figures it (plate lvii. fig. 1) as larger than the Australian *Œdicnemus grallarius*; but this is surely a mistake. Jerdon states (Birds of India, ii. p. 653) that he never procured the eggs of this bird in India; but Mr. Layard found it breeding in Ceylon.

Pluvianus ægyptius (Linn.). (Plate LX. fig. 2.)

The only account that I have found of the nesting of this bird is in Bädeker's work. He refers to it as breeding on the sandy islands of the Nile, and says "it scratches a hole in the sand or gravel, and lays four eggs therein. These are very difficult to find, as the vigilant bird when it observes the approach of an intruder covers them over before it leaves the nest." The eggs seem to be extremely rare in collections. That now figured is the only one which I have seen. It was found on a sand-bank near Damietta, by Mr. J. H. Cochrane, who shot the old bird in May 1862.

It may be here observed that this so-called Nile Plover is not confined to East and North-east Africa, but is also found on the west coast. Hartlaub records it from Senegambia (Orn. W.-Afr.). Monteiro found it in Angola (Ibis, 1862, p. 336); and I have in my collection a specimen which was obtained by Mr. Ussher on the Volta river in August 1870.

Hoplopterus spinosus (Linn.).

The North-African Spur-winged Plover is one of the commonest birds in Egypt, where it remains throughout the year. Captain Shelley states (Birds of Egypt, p. 232) that it commences to breed in March, at which season he has found as many as thirty nests close together towards the point of a sand bank. It also breeds in the fields. The nest consists of a circular shallow hole in the sand, roughly lined with short pieces of dried reeds, just sufficient to prevent the eggs from touching the ground.

Four, taken by Mr. J. H. Cochrane about three miles above Damietta, are now before me. They are not unlike the eggs of *Lobivanellus goensis*, above referred to.

Chætusia coronata (Gmelin).

For two eggs of this African Plover I am indebted to my friend Mr. E. L. Layard, who procured them with several others in Cape Colony. The nest, he informed me, is a mere depression in the soil, and was generally found to contain but three eggs. Andersson thought that this species must breed in Damaraland, as he found young birds there in almost every stage of plumage (*cf.* Birds of Damara Land, p. 269). A specimen is figured by Thienemann (plate lviii. fig. 6); but the figure is unsatisfactory for want of colour.

ŒDICNEMUS MACULOSUS, Temm.

This is another egg obtained by Mr. E. L. Layard in Cape Colony, where the bird is generally distributed, preferring broken ground sparingly covered with dwarf bush. The nest, like that of the last-named bird, is a mere depression in the soil. This egg, I find, is figured by Thienemann (plate lvii. fig. 3), but is unfortunately uncoloured.

ÆGIALITIS PECUARIUS (Temm.). (Plate LX. fig. 4.)

Since working out the synonymy of this species (Ibis, 1873, p. 262), I find that Vieillot's specific name *varius*, to which I gave priority in consequence of its having been published four years prior to *pecuarius* of Temminck, had been previously applied by Linnæus (ex Brisson) to the Grey Plover, *Squatarola helvetica*, so that Temminck's name will stand after all.

In the paper above referred to (p. 266) I thus described the eggs of this bird, one of which is now figured:—"The eggs, of which I have specimens procured in South Africa by my friend Mr. Layard, are most like the eggs of *Æ. tricollaris* and *Æ. nigrifrons* (Australia). They are a trifle smaller than those of the well-known *Æ. cantianus*, less pyriform in shape, and with a smoother and therefore more glossy shell. In colour, though not in shape and size, they remind one of the egg of *Cursorius gallicus*, being of a pale clay-colour closely freckled over with minute specks and scratches of umber-brown."

ÆGIALITIS TRICOLLARIS (Vieill.). (Plate LX. fig. 5.)

This bird, according to Mr. Layard (who presented the specimen now figured), breeds on the sea-shore or along the banks of streams and "vleys" in the Cape Colony and never far from water. "The nest," he adds, "is a mere depression in the soil, unprotected by stone or bush; and the eggs, enormous for the size of the bird, are two in number, of a dirty white ground-colour, profusely and minutely covered with hair streaks, having a tendency to run in zones, there being always one at the obtuse end." This peculiar character is not shown by Thienemann, whose figure of this egg (plate lix. fig. 7) is not satisfactory.

VANELLUS CAYENNENSIS (Gmelin).

This South-American Lapwing in its mode of nesting, number and colour of its eggs, closely resembles our well-known *Vanellus cristatus*.

An egg now before me was taken by Mr. G. Fitzmaurice in Uruguay, not far from Monte Video.

ÆGIALITIS FALKLANDICA (Latham). (Plate LX. fig. 6.)

I am indebted to Mr. Gould for a nest of three eggs of this species from the Falkland Isles, one of which is here figured. I believe no representation of this egg has been previously published, although Captain Abbott has referred to his having found the nest and eggs, without describing them, also in the Falkland Isles. He says (Ibis, 1861, p. 155.), "This Plover is a spring visitor, arriving about the beginning of September, and breeding shortly afterwards, although I have also found a nest with fresh eggs in it in October. The eggs, three in number, are generally laid on a bank at a short distance from the beach, without any nest, being merely deposited in a hole."

This species is not confined to the Falkland Isles, but is met with also throughout Patagonia and Chili.

ÆGIALITIS COLLARIS (Vieillot). (Plate LX. fig. 7.)

This is one of the birds which Mr. Edward Bartlett found breeding on the Upper and Lower Ucayali (*cf.* P. Z. S. 1873, p. 309). His note on the species is to the effect that it breeds on the sand banks in company with *Chordeiles rupestris* and *Phaethusa magnirostris*, laying two, sometimes four eggs, smaller but similarly coloured to those of our Little Ringed Plover. From a comparison of the eggs, I may add that those of *Æ. collaris* are of a richer or warmer colour than those of *Æ. minor*, which in other respects they much resemble. From what we know of the habits of its congeners, no doubt the full complement of eggs is always four.

LOBIVANELLUS LOBATUS (Latham).

Mr. Gould has kindly presented me with eggs of this and the following species from New South Wales. In his 'Birds of Australia,' and subsequently published 'Handbook' on the same subject, he has mentioned various localities for this bird in Southern and Western Australia, and he was then of opinion that it was not found in North Australia. Specimens, however, have reached me from Wide Bay, Queensland, so that it is evident the species is pretty generally distributed. It is found in Tasmania and on the islands of Bass's Straits—particularly on Green Island, where it breeds. It frequents marshy ground and the borders of inland pools and lakes, and breeds in September and October. Mr. E. P. Ramsay, who has figured the eggs of this and the following species (Ibis, 1867, pl. ix.), states that "the eggs, which are four in number, are placed with the thin ends inwards, and laid upon the ground by the side of some tuft of grass or rushes, in a slight hollow made for their reception, with occasionally a few blades of grass placed under and around them, but as often as not without any sign of a nest."

This Plover, like the well-known European Lapwing, shows great anxiety for its eggs and young, fluttering off at the approach of an intruder, and using every artifice, by feigning broken leg or wing, to entice him away from the spot.

SARCIOPHORUS PECTORALIS (Cuvier).

According to the observations of Mr. E. P. Ramsay (*l. c.*) this bird breeds in similar situations to the last named, but somewhat earlier in the season. It is more local, however, and frequents drier tracts of country. Mr. Morton Allport has recorded the fact of its breeding in Tasmania (Proc. Roy. Soc. Tasmania, 1859, vol. i.

p. 300). The eggs of this and the last-named species have the ground-colour much greener than is usual with the *Vanellinæ*.

ŒDICNEMUS GRALLARIUS (Lath.).

The egg of this fine Thick-knee, from Western Australia, was presented to me by Mr. Gould. Although specimens vary in colour as well as in markings, they are usually of a pale buff, thickly blotched over with umber-brown. They are always two in number, and are laid on the bare ground, during September and October.

ÆGIALITIS RUFICAPILLUS, Gould. (Plate LX. fig. 8.)

The egg here figured is one of four taken on Rotnest Island, Western Australia. It is to be regretted that the collector who took the trouble to identify them did not also forward with them some details of the haunts and breeding-habits of the parent birds, with an account of the time and manner of nesting. There is no reason, however, to suppose that it differs much in this respect from others of the Ringed-Plover group; and it doubtless approximates more nearly to our Kentish Plover than to any other.

ÆGIALITIS NIGRIFRONS (Cuvier). (Plate LX. fig. 9.)

The egg of this pretty little Ringed Plover will probably be new to many. It was taken with others by Mr. Wilson on the river Namoi, New South Wales, towards the end of December.

HIMANTOPUS LEUCOCEPHALUS, Gould.

I am indebted to Mr. J. A. Harvie Brown for the eggs of this and the two following species. They were taken for him in Canterbury Settlement, N. Z., by his friend Mr. J. R. Cook, of Blue-Cliffs Run, in that settlement, and most kindly forwarded to me. The eggs of this Stilt are scarcely distinguishable from those of the European species.

HIMANTOPUS NOVÆ-ZEALANDIÆ, Gould. (Plate LX. fig. 10.)

The egg here figured is one from a nest of four, taken by Mr. J. R. Cook on the shingle of the Otaio river-bed, on the 14th October, 1872, on which day he took three nests, each containing four eggs. He reports that they were easy to find, as the birds were bold and noisy. The nest was composed of drift-weed, and fairly well built. Mr. Cook says the local name of the bird is "Poaka," a name not mentioned by Mr. Buller (Birds of New Zealand, p. 205), who gives "Kaki" as the New-Zealand name. But doubtless different names are applied to the same bird in different parts of the country. The markings on these eggs have a tendency to run in streaks, instead of being in spots or blotches, as is the case with other species of the genus.

ANARHYNCHUS FRONTALIS (Quoy & Gaim.). (Plate LX. fig. 11.)

This last egg, for which I am indebted to Mr. J. A. Harvie Brown, is perhaps the most interesting of the whole series. Since

I published my account of this singular species in the 'Ibis' (1869, p. 304) several additional and interesting particulars have been added to its life-history by Mr. Potts (Trans. N. Z. Inst. vol. iii. p. 93) and by Mr. Buller (Birds of New Zealand, p. 216).

The egg, however, has not hitherto been figured; and the following notes, by the collector, will doubtless be acceptable to ornithologists. Mr. J. R. Cook, the collector above referred to, reports that he took the egg here figured with two others from a nest in the Otaio river-bed, Canterbury Settlement, on the 20th October, 1872. The nest was on sand amongst shingle, and very hard to find, although the birds were bold. The eggs were placed point downwards and were almost covered with small pieces of lichen, apparently placed there by the bird for the purpose of concealing them during its absence from the nest.

EXPLANATION OF PLATE LX.

Fig. 1. *Glareola lactea*, p. 455.
2. *Pluvianus ægyptius*, p. 456.
3. *Hoplopterus ventralis*, p. 455.
4. *Ægialitis pecuarius*, p. 457.
5. —— *tricollaris*, p. 457.
6. —— *falklandicus*, p. 457.
Fig. 7. *Ægialitis collaris*, p. 458.
8. —— *ruficapillus*, p. 459.
9. —— *nigrifrons*, p. 459.
10. *Himantopus novæ-zealandiæ*, p. 459.
11. *Anarhynchus frontalis*, p. 459.

11. On Fossil *Arvicolidæ*. By Humphrey P. Blackmore, M.D., and Edward R. Alston, F.Z.S.

[Received June 10, 1874.]

In the following pages we have attempted to review the information which we at present possess as to *Arvicolidæ* that have been found in a fossil state, and their relationship to recent species. In the course of our investigations the conclusion has been forced upon us, that in many cases it is not possible to identify and define species of this family by the pattern of the molar teeth *alone* with the accuracy which has been claimed; and as these are the only characteristic remains which are forthcoming in the case of most of the fossils, it follows that some of our determinations are and must be merely approximate.

Blasius seems to have been the first to recognize the diagnostic value of the form and number of the prisms which form the crowns of the molars in the *Arvicolidæ*; and when taken along with other structural details and with external characters they afford an invaluable key to the numerous species and varieties of this most difficult group. But when considered alone they are not conclusive in every case. Thus, for example, *A. arvalis* cannot be separated by its teeth from the very distinct *A. subterraneus*, while many species are liable to occasional individual variations which might well be regarded as showing specific distinction if other characters were overlooked. Again, the form and proportions of some of the bones of the skull vary very considerably according to the age of the animal—a fact which has been overlooked by many writers (as Prince Bonaparte and M. Pomel), who have attributed specific value to slight cranial differences. In accordance with these views we have thought it necessary considerably to reduce the number of recorded species.

Remains of *Arvicolidæ* have been found in the upper beds of the Norwich Crag series, in the breccia of the Mediterranean islands, in brick-earths and other deposits of the Drift period, and in many bone-caves in England, France, Belgium, Germany, and Italy. When not identical with the species now inhabiting these countries, they show affinity, as might be expected, with North-European and Siberian forms; and the two species of restricted *Myodes*, in particular, are very characteristic of the glacial fauna of which they were members.

Before proceeding to the enumeration of the species, we have to express our best thanks to those who have assisted us with information and the loan of specimens, especially to the Committee of the Norfolk and Norwich Museum, to Sir Charles Lyell and Prof. Owen, Messrs. Boyd Dawkins and Sanford, Mr. Moore, of Bath, Messrs. Southwell, Harmer, and Reeve, of Norwich, and Mr. Bidgood, of Taunton.

1. ARVICOLA GLAREOLUS (Schreber).

1846. *Arvicola pratensis*, Owen, Br. Foss. Mamm. p. 208, fig. 78.

1852 (?). *Arvicola delarbrei* (sp. n.), Pomel, Ann. Sc. de l'Auvergne, xxv. p. 362.

1855. *Arvicola glareolus*, Hensel, Zeits. d. Deutsch. Geol. Ges. vii. p. 483.

1866. *Arvicola pratensis*, Boyd Dawkins & Sanford, Pleistoc. Mamm. (Introd.) p. xxxvi.

1869. *Arvicola pratensis*, Boyd Dawkins, Q. J. Geol. Soc. xxv. p. 194.

1870. *Arvicola glareolus*, Sanford, *ibid.* xxvi. p. 124.

The Red Field-Vole was first noticed as a fossil species by Prof. Owen, under Baillon's name of *A. pratensis*, some remains obtained by Mr. McEnery from Kent's Hole, now in the British Museum, having been identified by Mr. Waterhouse. M. Pomel's *A. delarbrei*, from the Brèche de Coudes, is stated to be a little larger than *A. glareolus*, and to differ slightly in the details of the molars; but these are points in which individual variations are constantly found in the recent animal. The species appears to have been rare in England in Pleistocene times; Mr. Boyd Dawkins added no new localities; and Mr. Sanford had only seen two jaws, one of which, from Hutton Cave, is in the Taunton Museum. Mr. C. Moore has found a detached first lower molar in a cavern near Bristol; we have a jaw from Wookey Hole in our own collection; and a fragmentary jaw and some separate teeth from the Norfolk forest-bed series are in the Norwich Museum.

A. glareolus has a recent European range north of the Alps and Apennines, extending to within the Arctic Circle and to the Ural

Mountains; and it is widely but locally distributed throughout Britain. Its fossil remains do not appear to have been recognized, except in France and England.

The molars of this species are distinguished from those of all the other known Voles (except the nearly allied *A. rutilus*, Pall.) by the development in the adult animal of distinct roots, whence it has been generically separated under the name *Hypudæus*, Illig.* The enamel-folds are proportionally thicker than in the other species, the cemental spaces are more rounded, and the anterior ones of the first lower molar are more distinctly separated. The pattern, which is liable to slight individual variation, especially in the third upper molar, is as follows:—

Upper	I.	5 spaces	6 angles.	*Lower*	I.	7 spaces	9 angles.
,,	II.	4 ,,	5 ,,	,,	II.	5 ,,	6 ,,
,,	III.	6 ,,	7 or 8 ,,	,,	III.	3 ,,	6 ,,

We have examined the specimens in the British, Taunton, and Norwich Museums, and in our own collection.

2. Arvicola amphibius (Linn.).

1823. *Water-Rat*, Buckland, Rel. Diluv. p. 18, plate xi. figs. 1–6, 12–18.

1825. *Campagnol des cavernes*, Cuvier, Ossem. Foss. v. pt. i. p. 54.

1846. *Arvicola amphibia*, Owen, Br. Foss. Mamm. p. 201, fig. 76.

1846. (?) *Arvicola*, sp.?, Owen, *ibid.* p. 205.

1847. "*Hypudæus spelæus*, Cuv.," Giebel, Fauna der Vorwelt, i. p. 88.

1852. (?) *Arvicola antiquus*, sp. n., Pomel, Ann. Sc. de l'Auvergne, xxv. p. 361.

1852. (?) *Arvicola robustus*, sp. n., Pomel, *ibid.* p. 362.

1855. (?) *Arvicola*, sp.?, Lyell, Man. Elem. Geol. (5th ed.), pp. 156, 168, fig. 146.

1866. *Arvicola amphibia*, Boyd Dawkins & Sanford, Pleist. Mamm. (Introd.) p. xxxvi.

1869. *Arvicola amphibius*, Boyd Dawkins, Q. J. Geol. Soc. xxv. p. 194.

1870. *Arvicola amphibius*, Sanford, *ibid.* xxvi. p. 124.

Dr. Buckland found the remains of the "Water-Rat" so abundant in the Kirkdale Cave that almost every fragment of the osseous breccia which he examined contained teeth or broken bones, several of which he figured. Cuvier examined specimens from the same locality, and found them to agree well with this species, but remarked that, although larger than the remains from Sardinia and Corsica (= *A. brecciensis*, see p. 466), they were smaller than the recent *A. amphibius*. On this observation Dr. Giebel founded his "*Hyp. spelæus*, Cuv." Prof. Owen, however, found that specimens from Kent's Hole, agreeing closely in character with those from Kirkdale, were not inferior in size to the existing Water-Vole. Dr. Schmerling figures what appears to be the present species from the Belgian bone-caves ('Oss. Foss. des Cavernes de Liège,' 1833). In 1852 M. Pomel described two new species, *A. antiquus* and *A. robustus*, from the Brèche de Coudes and other French deposits, defining them by slight cranial differences, probably attributable to age, and by the anterior space of the first lower molar being rounded in the first and almost triangular in the second—a variation constantly met with in *A. amphibius*.

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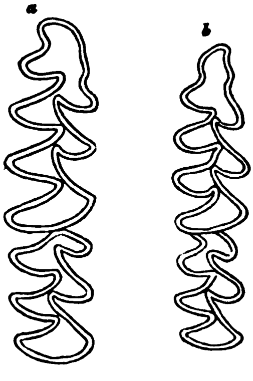
* Dr. Forsyth Major mentions a large species, resembling *A. amphibius* but with rooted molars, as found in the lignites of Leffe, in Lombardy, but has not yet named or described it (Atti Soc. Ital. Sc. Nat. xv. p. 584).

In considering the size of fossil Voles allied to the present, it must be remembered that several races now exist in Europe which vary very greatly in this respect, and which are often regarded as distinct species. Of these the best marked are *A. amphibius* (Linn.), *A. terrestris* (Linn.), and *A. destructor*, Savi; and it has been shown by Blasius (Säugeth. Deutschl. pp. 344–358) and by Fatio ('Campagnols du Léman,' pp. 36–48), that although typical examples of each form are very different in size, proportions, and external characters, yet they run into one another by such numerous gradations that it is impossible to find constant characters by which they may be defined and separated. Such being the case with the recent animal, it is, of course, all the more impossible to separate fossils by the teeth and jaws alone.

Prof. Owen mentions some portions of upper and lower jaws from "the older Pliocene crag near Norwich," found along with molars of *Mastodon angustidens*, as indicating a species of *Arvicola* intermediate in size between *A. amphibius* and *A. agrestis*. Sir C. Lyell, in his 'Elements' (5th ed.), figures these teeth, though on too small a scale for satisfactory identification, but remarks that he does not now regard these beds as *older* Pliocene, believing that some of their fossils, including perhaps the Mastodon, may have been washed out of the Red Crag. Prof. Owen having kindly informed us that the specimens in question had been in the collection of the late Miss Gurney of Northrepps, and were now in the Norfolk and Norwich Museum, we applied, through our friend Mr. Southwell, to the authorities of that institution, who most liberally allowed us every facility for their examination; and Mr. Reeve, the curator, has also obliged us with the loan of specimens from his private cabinet. Those from the Gurney collection are labelled "Ostend;" and Mr. F. W. Harmer kindly informs us that they are doubtless from the preglacial forest-bed series at that place (between Buckton and Hasbro', on the Norfolk coast). Mr. Reeve's examples are a single jaw from the *upper* bed of crag at Bramerton, and others from the freshwater beds overlying the forest-bed at Runton, near Cromer: Mr. Harmer considers these last of similar age to the Ostend deposits, and the fossils are identical in appearance. The Bramerton jaw (fig. 1, *a*, p. 464) is not inferior in size to ordinary English examples of *A. amphibius*, with which it perfectly agrees in dentition. The same remark applies to some teeth from Ostend; but other specimens from that locality (fig. 1, *b*, p. 464) and from

Runton are much smaller, being slightly less (and the jaws perhaps more slender) than in a Swiss skull of the small *terrestris* race. It is evident, therefore, that Prof. Owen was right in refraining from definitely separating these fossils from the recent *A. amphibius*, although the animal *may* of course have been sufficiently distinct, and also that the deposits in which they occur are much more recent than was formerly supposed.

Fig. 1.



Teeth of *A. amphibius.*

At the present day *A. amphibius* ranges throughout all Europe, and extends through the Caucasus to Persia, and to Northern Asia as far as the Sea of Okhotsk. The *destructor* race inhabits the Mediterranean countries; and the small *terrestris* form is principally found in the mountainous parts of Central Europe. Remains of the Water-Vole are found abundantly in many drift-deposits, and in most of the bone-caves of England, France, Belgium, and Germany.

The form of the teeth is very constant, except in minor details, and does not vary in the different races. The pattern is :—

Upper	I.	5 spaces,	6 angles.	*Lower*	I.	7 spaces,	9 angles.
,,	II.	4 ,,	5 ,,	,,	II.	5 ,,	6 ,,
,,	III.	5 ,,	6 ,,	,,	III.	5 ,,	6 ,,

We have compared the fossils in the British, Norwich, and Taunton Museums, and in our own collection with recent skulls from England, Scotland, and Switzerland.

3. ARVICOLA RATTICEPS, Keys. et Blas. (?).

1870. *Arvicola ratticeps*, Sanford, Q. J. Geol. Soc. xxvi. p. 125, pl. viii. fig. 1 *a–d*.

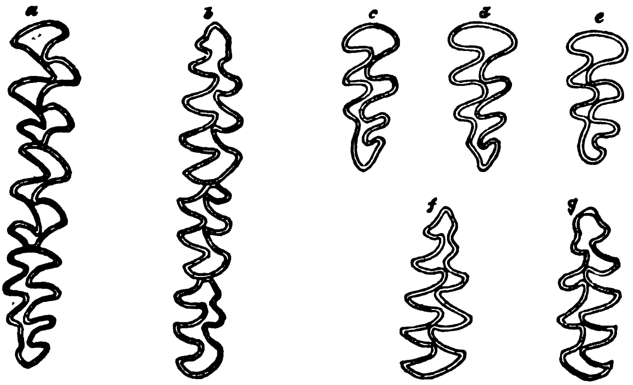
Among the Somersetshire cave-fossils in the Taunton Museum, Mr. Sanford recognized a part of a skull and several lower jaws as being undistinguishable from this northern species. In 1861 we had found a large number of jaws and other remains in a deposit of brick-earth of the Drift period at Fisherton, near Salisbury, associated with *Myodes torquatus*, *Spermophilus erythrogenoides*, &c.; and these we find to be certainly the same as the Somersetshire specimens. A skull from the Bromberg cavern (from the Sœmmering collection) is in the British Museum.

On comparing the dental pattern of these fossils with Blasius's figures of *A. ratticeps* (Säugeth. Deutschl. p. 366) we were struck with the great variety of form in the anterior part of the first lower molar, and more especially in the posterior part of the third upper molar. We were at one time inclined to believe that the fossil might be regarded as a distinct species, and are still of opinion that it may represent a race distinct from the recent *A. ratticeps*; but the variations are so great, both in the recent and the fossil skulls, that we have sought in vain for any constant characters for specific distinction.

In the first lower molar many specimens agree exactly with *A. ratticeps*, but in others the anterior extremity is produced beyond the first inner angle, so as to give the tooth the appearance of having *eight* cemental spaces instead of *seven*: this type is somewhat exaggerated in Mr. Sanford's fig. 1 *d*. The outer margin of the first two blended spaces is often less regularly convex than is usually the case in recent *A. ratticeps*, so that the whole tooth rather resembles Middendorff's illustration of *A. obscurus* ('Sib. Reise,' ii. pl. xi. fig. 4), and Hensel's of his *A. ambiguus* (= *A. brecciensis*, see p. 466).

But the most remarkable variation occurs in the third upper molar, which differs so much that it is only the numerous intermediate forms that convince us that all belong to the same species. A few, like that figured by Mr. Sanford, agree with typical *A. ratticeps* in having four external and four internal angles; but in many there are only *three* external angles, and the whole form of the tooth more resembles that of *A. arvalis*, while others present a type peculiar to themselves. All we have yet examined differ from *A. brecciensis* in having more than three internal angles (fig. 2, *a–f*).

Fig. 2.



Teeth of *A. ratticeps* and *A. nivalis*.

The recent skulls of *A. ratticeps* present considerable variations, though not to the extent shown in the fossils. In some the first lower molar shows a slight approach to the prolongation of the anterior extremity alluded to above; and Blasius himself remarks that the variation in the last upper tooth may lead to the formation of false species (*l. c.* p. 368). We must therefore regard the fossil animal as either identical with the recent, or as so nearly allied as not to be separable by the materials which remain to us.

The recent range of this Vole extends from Scandinavia (where Nilsson described it as *Lemmus medius*) through Lapland, North Russia, and Siberia as far as Kamtschatka.

The most striking character in its dentition is the manner in which the first two external angles of the first lower molar are blended in a broad convex pillar. The pattern is:—

Upper	I.	5 spaces,	6 angles.	*Lower*	I.	7 spaces,	9 angles.
„	II.	4 „	5 „	„	II.	5 „	6 „
„	III.	7 „	7 or 8 „	„	III.	3 „	6 „

We have examined all the specimens above referred to, and have compared them with recent skulls in the British Museum and in our own collection.

4. ARVICOLA NIVALIS, Martins.

1873. *Arvicola nivalis*, C. J. Forsyth Major, Atti Soc. Ital. Sc. Nat. xv. p. 584.

Dr. Forsyth Major has recently announced the discovery of the remains of this alpine species in the Cavern of Levrange in Lombardy. A single jaw found along with these, of the last species, at Fisherton, has much the character of *A. nivalis* in the form of the first molar (fig. 2, *g*, p. 465); but the variation in the other teeth among which it was discovered leads us to hesitate in describing the species as British until further evidence is obtained.

At the present day this species seems to be confined to the Alps of Central Europe, where it is found at an elevation of not less than 3000 feet above the sea-level; according to De Selys Longchamps it also inhabits the Pyrenees.

The dentition does not appear to be liable to much variation. The anterior extremity of the first lower molar is convex, passing at once into the first exterior or internal angles. The pattern is:—

Upper	I.	5 spaces,	6 angles.	*Lower.*	I.	8 spaces,	9 angles.
„	II.	4 „	5 „	„	II.	5 „	6 „
„	III.	6 „	6 „	„	III.	3 „	6 „

We have compared the single jaw figured with recent skulls of *A. nivalis* from Switzerland in the British Museum.

5. ARVICOLA BRECCIENSIS (Giebel).

1825. *Campagnol de Cette, de Corse, et de Sardaigne*, Cuvier, Oss. Foss. iv. p. 225, v. pt. i. p. 54.

1847. *Hypudæus brecciensis*, sp. n., Giebel, Fauna d. Vorwelt, i. p. 88.

1855. *Arvicola ambiguus*, sp. n., Hensel, Zeits. d. Deutsch. Geol. Ges. vii. p. 469, pl. xxv. figs. 3, 8, 9 (*nec* Pomel).

1859. *Arvicola brecciensis*, Gervais, Zool. et Paleont. Franç. (2^{me} ed.) p. 41.

A species of *Arvicola*, found in the breccia of the Mediterranean islands, was described but not systematically named by Cuvier, and subsequently by Wagner (Karsten's Archiv, xv. p. 10); and on these descriptions Dr. Giebel founded his *Hypudæus brecciensis*. On the ground that Giebel had not given sufficient diagnostic characters, Hensel re-named it *A. ambiguus*, overlooking the previous employment of that name by Pomel (see below, p. 469). Hensel defines the species as having *three* external and *three* internal angles to the third upper molar, and *four* external and *five* internal angles to the first lower molar. He considers that its nearest affinities among living forms were with the Siberian *A. obscurus*, the size and the form of the first lower molar agreeing well with Middendorff's figure of that species; but the third upper molar was very different, and the facial portion of the skull was shorter.

According to Hensel's figures and description, the pattern was:—

Upper	I.	5 spaces,	6 angles.	*Lower*	I.	7 spaces,	9 angles.
„	II.	4 „	5 „	„	II.	5 „	6 „
„	III.	5 „	6 „	„	III.	4 „	6 „

We have not seen specimens of this Vole; but if Hensel's characters are constant, the species would appear to be a good one.

6. ARVICOLA AGRESTIS (Linn.).

1823. *Young Water-Rat*, Buckland, Rel. Diluv. p. 265, plate xi. fig. 11.

1825. *Petit Campagnol des Cavernes*, Cuvier, Ossem. Foss. v. pt. i. p. 54.

1846. *Arvicola agrestis*, Owen, Br. Foss. Mamm. p. 206, fig. 77.

1847. *Hypudæus bucklandii*, sp. n., Giebel, Fauna d. Vorwelt, i. p. 88.

1852. (?) *Arvicola arvaloides*, sp. n., Pomel, Ann. Sc. de l'Auvergne, xxv. p. 362.

1852. (?) *Arvicola joberti*, sp. n., Pomel, *ibid.* p. 363.

1866. *Arvicola agrestis*, Boyd Dawkins & Sanford, Pleist. Mamm. (Introd.) p. xxxvi.

1869. *Arvicola agrestis*, Boyd Dawkins, Q. J. Geol. Soc. xxv. p. 194.

1870. *Arvicola agrestis*, Sanford, *ibid.* xxvi. p. 124.

Small remains of *Arvicolæ*, found in the Kirkdale Cave, were attributed by Dr. Buckland to "young Water-Rats." He sent specimens to Cuvier, who observes that they were not larger than *A. arvalis*, but that a femur was proportionally thicker, and that the pelvis figured by Buckland resembled *A. œconomus* rather than *A. arvalis*. At that time *A. agrestis* was universally confused with the common continental *A. arvalis*, and Cuvier probably never compared the fossils with the former species. Prof. Owen rightly identified the Kirkdale and Kent's-Hole specimens in the British Museum with *A. agrestis*, though he retained the error of giving "*Mus arvalis* of Pallas" as a synonym. Dr. Giebel, on the strength of Cuvier's remarks, bestowed the name *Hypudæus bucklandii* on the Kirkdale Vole *. In 1852 M. Pomel described *A. arvaloides* and *A. joberti* as allied to *A. neglectus* (= *agrestis*, cf. Blasius, Säugeth. Deutschl. p. 372), and distinguished only by slight cranial differences, to which no weight can be given. *A. agrestis* has been found in many bone-caves and other deposits in Britain. Mr. Sanford considers that in the Somersetshire specimens the diastema between the incisors and molars is longer, and the whole jaw straighter than in recent skulls. We have received jaws from the fissures in the limestone rocks near Bath, which exactly agree with recent specimens.

The species is widely spread throughout Northern and Central Europe, from Scandinavia and Finland to the Alps, but is most plentiful in the North. It is the commonest species almost everywhere in Britain, though *A. glareolus* appears to exceed it in numbers in some parts of Scotland.

The teeth of *A. agrestis* may be recognized at a glance, by the fact that the second upper molar has *five* cemental spaces instead of *four*. The third upper molar sometimes shows a very minute supplementary angle on the outside; this we have found both in recent and fossil skulls. The pattern is:—

Upper	I.	5 spaces,	6 angles.	*Lower*	I.	9 spaces,	10 angles.
,,	II.	5 ,,	6 ,,	,,	II.	5 ,,	6 ,,
,,	III.	6 ,,	7 or 8 ,,	,,	III.	3 ,,	6 ,,

We have examined the specimens in the British and Taunton Museums and in our own collection.

7. ARVICOLA ARVALIS (Pallas).

1873. *Arvicola arvalis?*, Forsyth Major, Atti Soc. Ital. Sc. Nat. xv. p. 589.

Several jaws found in fissures in the limestone rocks near Bath, which have been sent to us by our friend Mr. Moore, belong undoubtedly to a small group of Voles comprising *A. arvalis*, *A. saxatilis*, and *A. gregalis*, none of which are now natives of Britain. These species agree so closely in dentition that it is impossible to decide positively to which the fossils should be ascribed. In size and proportions they agree very closely with Siberian skulls of *A. saxatilis* in the British Museum; but they also much resemble some specimens of *A. arvalis*. As Dr. Forsyth Major has lately doubtfully referred similar examples (found in the Cavern of Levrange

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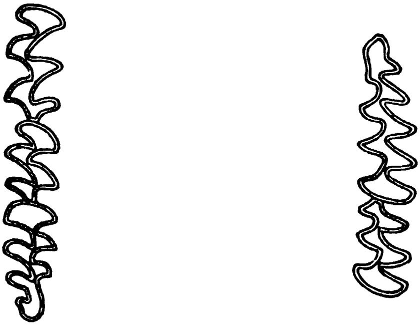
* Through a misreading of Cuvier's observations on the remains of *Mures* found by Buckland in the same cave, Giebel founded his *Hyp. minimus* (*l. c.* p. 88), which, consequently, is a synonym of some species of Mouse, probably *M. sylvaticus* (*cf.* Hensel, *l. c.* p. 484).

Fig. 3.



Teeth of *A. arvalis.*

and in the bone-breccia of Oliveto, near Pisa) to *A. arvalis*, we have thought it best provisionally to apply the same name to the Bath fossils.

This is the commonest species of Field-Vole in Central Europe, extending into Western Siberia, and, according to Radde, even as far east as the desert of Gobi. It is not found in Scandinavia, nor in Britain, and in Italy it appears to be confined to the northern provinces, being replaced in the former countries by *A. agrestis*, and in the south of Italy by *A. savii.*

The dentition varies slightly, the pattern being:—

Upper	I.	5 spaces,	6 angles.	*Lower*	I.	8 spaces,	9 angles.
„	II.	4 „	5 „	„	II.	5 „	6 „
„	III.	6 „	7 „	„	III.	3 „	5 „

We have compared the fossils with recent skulls in the British Museum and in our own collection.

8. Myodes torquatus, Pall.

1852. (?) *Arvicola ambiguus*, Pomel, Ann. Sc. de l'Auvergne, xxv. p. 363 (*nec* Hensel).

1855. *Misothermus torquatus*, Hensel, Zeits. d. Deutsch. Geol. Ges. vii. p. 492, pl. xxv. figs. 12, 13.

1864. *Lemmus grœnlandicus* ?, Blackmore, *ap.* Evans, Q. J. Geol. Soc. xx. p. 192.

1866. *Lemmus*, sp., Boyd Dawkins & Sanford, Pleist. Mamm. (Introd.) p. xxxvi.

1869. *Lemmus*, sp., Boyd Dawkins, Q. J. Geol. Soc. xxv. p. 194.

1870. *Lemmus torquatus*, var., Sanford, *ibid.* xxvi. p. 125, pl. viii. figs. 4, 4 *a.*

1870. *Arvicola gulielmi*, sp. n., Sanford, *ibid.* xxvi. p. 125, pl. viii. figs. 2 *a*, *b.*

1873. *Myodes torquatus*, Forsyth Major, Atti Soc. Ital. Sc. Nat. xv. p. 111, pl. 2.

In 1852 M. Pomel described *Arvicola ambiguus*, a new species from the Brèche de Coudes, with twelve angles on the first lower molar. Counting the anterior extremity as an angle, this agrees with the present animal, and the rest of his description applies so well as to leave no doubt that he had a Lemming of this species before him. Three years later Hensel recognized this species among fossils from the diluvium of Quedlinburg, in Saxony, in the Mineralogical Museum of Berlin. In this country we discovered it in some numbers in 1865 in the drift-deposits at Fisherton; and next year Mr. W. Flower sent us some specimens for identification, procured from Wookey Hole. In 1870 Mr. Sanford recognized part of a skull in the Taunton Museum as only differing from recent specimens in being slightly larger. At the same time he referred six lower jaws in the same collection to a new species of *Arvicola*, which he provisionally named *A. gulielmi*, remarking that they might prove the same as Pomel's *A. ambiguus*. Dr. Forsyth Major has since pointed out that these appear to be the lower jaws of the present species—a conclusion at which we had independently arrived, and in which we believe Mr. Sanford now fully concurs. Remains from Hohlenstein, near Ulm, are described by Dr. Forsyth Major; and a fine skull from Eppelsheim, near Darmstadt, is in the British Museum.

Middendorff has clearly shown ('Sibir. Reise,' ii. th. 2, pp. 87–99) that *M. hudsonius*, Pall., *M. grœnlandicus* (Trail), and *Lemmus ungulatus*, Baer, are all identical with *M. torquatus*, whose range may therefore be described as circumpolar. It is found in the Hudson-Bay countries, in Novaja Zemlja, from the White Sea to the Obi, in Taimyrland, on Baer Island, and Novaja Siberia, and from the Lena to the Jana. It appears to be very rare in Greenland (*cf.* Brown, P. Z. S. 1868, p. 349), and is not found in Russian Lapland. Parry found a skeleton in N. lat. 82°, while it reaches its most southern point in Unaláska, under N. lat. 54°. In postpliocene times it appears to have extended at least as far south as Germany, England, and the basin of the Loire.

In this species the prisms of the posterior molars are not compressed and twisted as in the typical *Myodes*, but are placed regularly as in *Arvicola*; and Hensel has consequently separated it as a new genus, under the name *Misothermus*. The pattern, which appears to be very constant, is:—

Upper	I.	7 spaces,	8 angles.	*Lower*	I.	9 spaces,	11 angles.
„	II.	6 „	7 „	„	II.	5 „	7 „
„	III.	6 „	8 „	„	III.	4 „	6 „

We have compared recent and fossil skulls in the British and Taunton Museums and in our own collection.

9. MYODES LEMMUS (Linn.).

1855. *Myodes lemmus*, Hensel, Zeits. d. Deutsch. Geol. Ges. vii. p. 486, pl. xxv. figs. 10, 11, 15.

1870. *Lemmus norvegicus*, var., Sanford, Q. J. Geol. Soc. xxvi. p. 125, pl. viii. figs. 3 *a*, *b*.

The Norwegian Lemming was first detected in a fossil state by Hensel, who found remains in the same deposits at Quedlinburg as the last species. In Britain it has only been found, as far as we are aware, in the Somersetshire bone-caves. Six lower jaws from these caverns are in the Taunton Museum, and were identified with this species by Mr. Sanford, although he remarks that they are slightly smaller and have the condyle somewhat more slender than recent specimens. They agree, however, so closely, especially with skulls of young animals, that we do not think there can be any doubt as to their identity.

At the present day *M. lemmus* is very restricted in its range, being found only in the Scandinavian peninsula and in Russian Lapland. In the postpliocene epoch it extended at least as far south as Saxony and England.

In this species, as in the allied *M. obensis*, the prisms of the posterior molars in both jaws are nearly separated from each other, the folds of enamel passing almost completely across the tooth; they are much twisted and compressed longitudinally. The last upper molar sometimes varies slightly; but the rest of the pattern is very constant, being:—

Upper	I.	5 spaces,	6 angles.	*Lower*	I.	5 spaces,	7 angles.
,,	II.	4 ,,	5 ,,	,,	II.	5 ,,	6 ,,
,,	III.	4 ,,	6 or 7 ,,	,,	III.	4 ,,	5 ,,

We have compared the jaws in the Taunton Museum with recent specimens in our own collection.

12. On the "Showing-off" of the Australian Bustard (*Eupodotis australis*). By A. H. Garrod, B.A., F.Z.S., Fellow of St. John's College, Cambridge, Prosector to the Society.

[Received May 23, 1874.]

Whether the account of the production of the great distention of the neck in the male Australian Bustard which follows will in any way simplify the question of the presence or absence of a gular pouch in Bustards generally, is doubtful. At all events it will rectify an accepted error, and add a fresh fact to the considerable literature of the subject.

In the 'Proceedings' of this Society for 1868 (p. 471 *et seq.*), Dr. Murie pictures the sexual "show-off" in a specimen of *Eupodotis australis* which was presented to the Society in April 1866, by the Acclimatization Society of Sydney, and infers, from its appearance, that, as an undoubted fact, the gular pouch is present in this specimen of the species at least.

In 1873, during one of the months in which it was "showing off," namely in May, I examined the mouth of this identical bird while alive, and could find no trace of a sublingual orifice, and, what is more, felt and saw a median frenum linguæ quite distinctly. This made me doubt the correctness of Dr. Murie's inference, that, because the neck of *Eupodotis australis* becomes distended much during the sexual season, *therefore* there is a gular pouch.

This individual bird, which formed the subject of Dr. Murie's plate (P. Z. S. 1868, pl. xxxvi.), died on May 11, 1874, having shown off in its wonted manner during the few preceding weeks. An excellent opportunity was thus afforded for the decision of the question whether or not this specimen had a gular pouch.

Fig. 1.

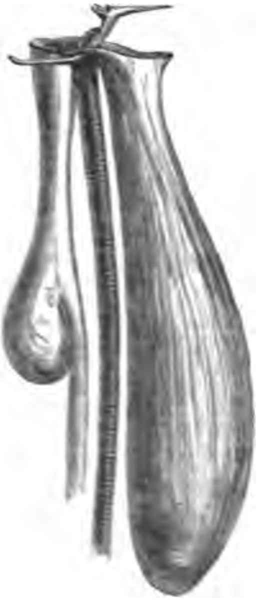


Fig. 2.

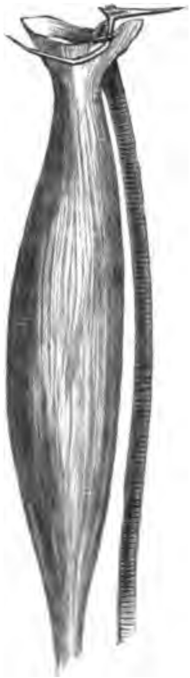


Fig. 1. The œsophagus, trachea, and gular pouch of a specimen of *Otis tarda*, seen from the side. The crop is here drawn as in the actual preparation, projecting backwards, and not forwards as usual.

Fig. 2. The œsophagus and trachea of the specimen of *Eupodotis australis* here described. The œsophagus is much dilated, and, like that of the Pouter Pigeon, can be distended with air by the living bird. No trace of a pouch or crop is to be seen.

There was no gular pouch. There was no sublingual orifice. The frænum linguæ was well developed, it being necessarily quite absent in the adult male of *Otis tarda*. How unsafe therefore is it to infer that, because the neck distends and depends during the "show-off," there must be a sublingual pouch. It is quite possible that two effects, very similar in appearance, in closely allied birds, may be the result of different mechanisms. In the feet of the *Cuculidæ* and the *Picidæ* the scansorial arrangement of the toes is the result of entirely different dispositions of the tendons which move them; and in *Otis tarda* and *Eupodotis australis* the same reasoning holds.

In both these birds there is, during the show-off, a distention with air of a well differentiated bag, which is in both cases lined with a true mucous membrane. But in *Otis tarda* this sac is a special structure in front of the windpipe, opening under the tongue; whilst in *Eupodotis australis* (in the specimen under consideration at least), it is simply a highly dilated œsophagus.

Through the kindness of Lord Lilford I am in possession of an excellent Spanish specimen of the gular pouch of *Otis tarda* (see fig. 1, p. 472), with the whole of the œsophagus, the tongue, and part of the trachea attached. In it the gular pouch, opening sublingually, is capacious, and, when distended, egg-shaped with no constriction in any part. The œsophagus is uniformly cylindrical for its upper two thirds, and not at all enlarged. Lower down there is a well-developed globular crop.

In the specimen of *Eupodotis australis* which died on May 11, as previously mentioned, there is no trace of a gular pouch. The œsophagus is enormously dilated from its commencement (see fig. 2, p. 472), and gives no indication whatever of any division into tube and crop. Its greatest circumference, when fairly inflated, is 14 inches, and the length of the distended portion of the tube is 17½ inches. Before dissection, by filling its cavity with air, the lower portion of the dilated œsophagus protruded downwards considerably in front of the *symphysis furculæ*, and formed the depending portion of the sac which was so conspicuous in the living animal. The trachea descended *in front* of this sac; and when the latter was undistended, the former, on account of the diminished distance between the points it had to reach, was zigzagged from side to side in the part opposite the pendent portion. The keeper, J. Church, tells me that, when handling the sac in the living bird, he always felt a hard cord running down in front of it, which was evidently the windpipe. The dilated œsophagus was, as might have been expected, covered with two coats of muscular tissue, the outer longitudinal—and the inner transverse. The mucous lining presented no peculiarities. The skin in front of the neck was lax, with a considerable amount of coarse fat in its deeper layer; it was engorged with blood, tortuous vessels running through it in all directions.

I may mention as an anatomical peculiarity of interest that *Eupodotis australis* and *E. denhami* possess but one carotid artery, the *right*—a condition I have not seen in any other bird; *Otis tarda* and *O. macqueeni* have *two*, and *Tetrax campestris* the *left* only. Most probably the presence of a right carotid only is characteristic of the genus *Eupodotis*.

13. On the Skeleton and Lineage of *Fregilupus varius*.

By Dr. JAMES MURIE, F.L.S.

[Received June 16, 1874.]

(Plates LXI. & LXII.)

HISTORY OF THE BIRD.

Preliminary Remarks.—By the zeal for ornithology and the urbanity of Prof. Newton, I am stimulated to render a more ample account of the skeleton of *Fregilupus* belonging to him, and briefly commented on by me in the 'Ibis' of 1873[*]. As therein mentioned, there is no representative of the type, in skin or otherwise, in England of this singular so-called Madagascar form, save the skeleton in question. The literature of its anatomy is confined to my own curt osteological remarks. I now figure the mounted skeleton, of natural size, and in addition, in a second Plate, such characteristic sketches of the separated bones as may better enable comparisons to be instituted.

This specimen (as I am informed), was given to Prof. Newton by the late M. Jules Verreaux, who said that he shot the bird from which it was preserved in the island of Réunion many years since (1832?). The species is now to all appearance extinct, and, notwithstanding what has been said of it, seems to have been confined to that one island. The fact is that, if *Fregilupus* is not quite extinct, it evidently is fast becoming so; for recent writers aver it is no longer to be obtained in its old haunts, and somewhere about twenty years have elapsed since any thing positive concerning its existence has been authenticated[†]. Thus I am the more impressed with the necessity for a published record accompanied by osteological illustration. If, as is to be feared, before long it shall be looked upon as a bird of the past—gone like the Dodo, Solitaire, Aphanapteryx, &c.—then it would be a pity to let the present opportunity slip. Moreover this skeleton and another said to have been deposited in the Paris Museum, having both been procured by an ornithologist of reputation and prepared by his own hands, have a stamp of certainty about them enhancing their value. This extreme paucity of material, and possibility of no future supply, may yet render them invaluable historical examples, marking the progress of avian extinction in the Mascarene Islands.

Original observations pertaining to the bird are few and not very satisfactory in substance. Indeed I find nearly all the travellers' accounts to be but a repetition of the earlier imperfect notices, these same being looked upon rather suspiciously by those best qualified to estimate their worth. For the sake of bringing within easy compass the known history of *Fregilupus*, I insert in

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[*] "On the *Upupidæ*," *tom. cit.* p. 200.

[†] *Vide* footnote from Schlegel, p. 479.

J Murie

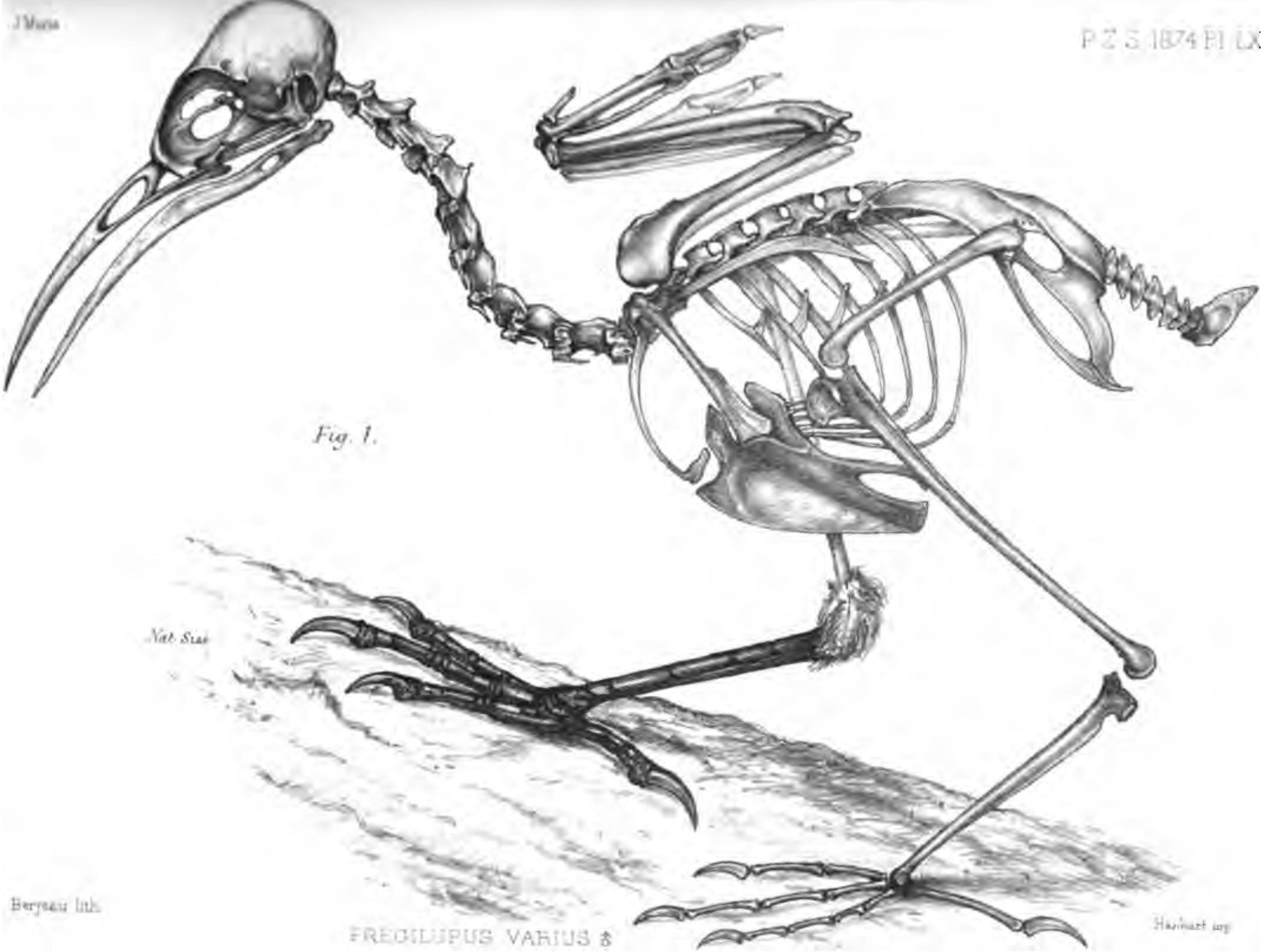
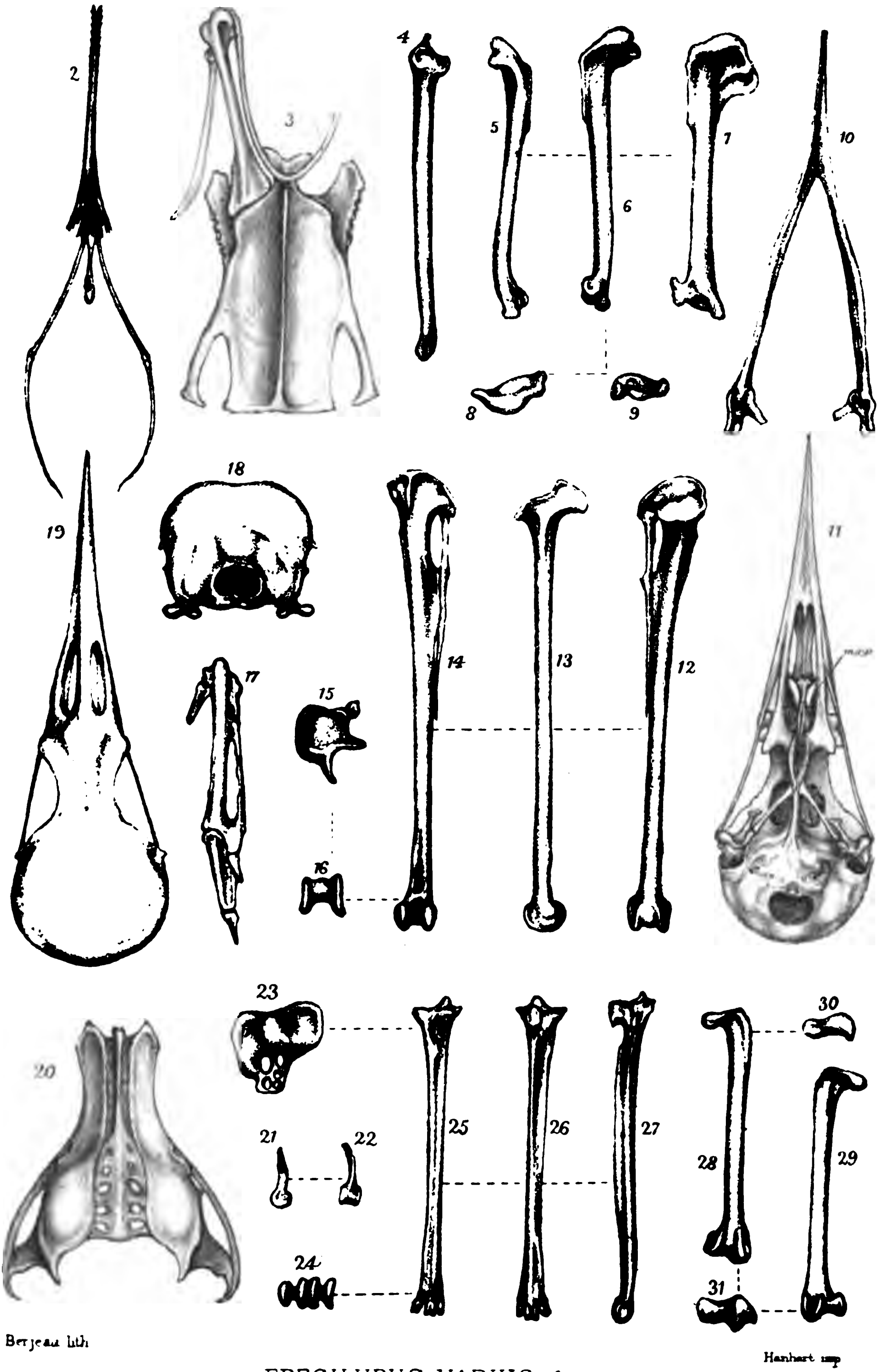


Fig. 1.

Berjeau lith.

FREGILUPUS VARIUS ♂

Hanhart imp.



Berjeau lith.
Hanhart imp.

FREGILUPUS VARIUS. ♂.

footnotes the bulk of the published data. Thus drawn up in rank and file, the gaps are conspicuous. If a credible and thoroughly reliable estimate of the bird, its local range, &c. is ever to be obtained, the subjoined wants and hints may, I trust, be found appropriate and useful as passing memoranda.

Desiderata.—

1. Whether *Fregilupus* was absolutely restricted to Réunion or where else with certainty it has been found.
2. Whether it is still alive on Réunion or elsewhere, and the locality where found, personal and second-hand information being duly noted.
3. Any documents proving the last date when observed.
4. By what means coastwards is it supposed to have become rare, or the steps and progress of its extinction. Has the introduction of the common Indian Mynah, by diminishing its food, tended to reduction? or has man been the suppressing agent?
5. All data connected with its habits would be invaluable, especially the nature of its food, nest-building, colour and number of eggs.
6. Any account of successive change of plumage or variety in the feathering of the young and in sexual development.
7. If any specimens are ever procured, it is most important that one or more of these, at different ages and sexes if possible, be preserved entire in spirits or otherwise, so that the internal anatomy, pterylosis, &c. may be accurately ascertained by those competent to the task.
8. If a preservative solution is not at hand, by simply slitting up the belly without injuring the internals, filling this with salt or placing the entire specimen in salt or sugar, it will be saved. If these cannot be procured, drying the body complete in a current of air or in the shade so that it becomes thoroughly hardened will effectually prevent decomposition, remembering, however, that it must afterwards be kept free from damp and the attacks of insects in its transmission.

Synonymy and Figures.—

FREGILUPUS VARIUS (Boddaert).

?"*Tiuouch,*" Flacourt, Hist. d. l. Grande I. Madag. p. 166 (1658).

La Huppe noire et blanche, du Cap de Bonne Espérance, De Montbeil. in Buffon, Hist. Nat. vi. p. 463 (1779).

Madagascar Hoopoe, Latham, Gen. Synop. i. pt. ii. p. 690 (1782).

La Huppe du Cap de Bonne Espérance, De Montbeillard, Pl. Enl. 697 (1783).

Upupa varia, Boddaert, Tabl. Planch. Enlum. p. 43 (1783).

Upupa capensis, Gmelin, Syst. Nat. i. p. 466 (1788).

La Huppe grise, Vieill. Ois. Dorés, i. (Hist. d. Promérops) p. 12, tab. 3 (1802).

Le Mérops Huppé, Levaill. Ois. d. Parad. iii. (H. N. d. Promér. et Guêp.) p. 43, tab. 18 (1807).

Upupa madagascariensis, Shaw, Zool. viii. p. 140 (1811).

La Huppe du Cap (*Upupa capensis*), Cuv. Règ. An. i. p. 407 (1817).

Coracias tivouch, Vieill. Nouv. Dict. d'Hist. Nat. viii. p. 3 (1817).

Coracia cristata, Vieill. Tab. Encl. 697 (1823).

Pastor upupa, Wagler, Systema Avium, p. 90 (1827).

Fregilupus capensis, Less. Traité Ornith. i. p. 324 (1831); Bonap. Consp. Gen. Av. p. 88 (1850).

Fregilupus madagascariensis, Reich. Hand. d. sp. Ornith. p. 321, t. 596. fig. 4039 (1851); Hartlaub, Orn. Beitr. z. Faun. Madag. p. 53 (1861); Schleg. Recher. Faun. Madag. p. 104 (1868); Giebel, Thesaurus, p. 627 (1874).

Fregilupus borbonicus, Vinson, Bull. Soc. Acclim. p. 627 (1868); Giebel, Thesaurus, p. 627 (1874).

Fregilupus varia, Gray, Hand-list of Birds, pt. ii. p. 28 (1870).

Lophopsarus, Sundevall, Meth. Nat. Av. Disp. Tent. p. 40 (1873).

The illustrations representing this rare Bourbon bird, as well as I can judge, are limited to two originals, De Montbeillard's and Levaillant's. Which is most to be depended on it is hard to say, though the concurrent testimony of Hartlaub, in his description from well-preserved skins, renders it probable that Levaillant's figure is, on the whole, the most natural and truthful. Vieillot's figure, one would suppose, is a modification of De Montbeillard's, but with a bright blue iris, more highly worked in the feathering, and with a wing-tint intermediate between De Montbeillard's slate-colour and Levaillant's chestnut hue. It would seem as if Vieillot's artist had taken the published engraving as his model, the colouring possibly from a museum skin, and for the eyes was indebted to his imagination. Reichenbach's (a copy of course) is a very much reduced outline of Vieillot's, partly coloured after all three figures. Somehow or other, none of the figures extant seem to me a natural representation; there is a crude stiffness in the crest, and other detail by no means life-like.

Views promulgated and Historical Survey.—In Flacourt's[*] list of the fauna of Madagascar a few words in mention of a bird named "Tiuouch," or, according to modern typography, "Tivouch" (not Ti*n*ouch and Ti*r*ouch, as some subsequent writers spell it) are regarded as the earliest notice of our form. But the identification of this with that now known as *Fregilupus* is very obscure; and some ornithologists (see Newton's remarks, p. 479) have grave doubts thereon. Buffon's[†] "La Huppe noire et blanche, du Cap De Bonne

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[*] The following is literally all said by the old voyageur and Directeur général de la Compagnie François de l'Orient:—"*Tiuouch* c'est la huppe, il est tacheté de noir et de gris, et a une belle crest de plume."—De Flacourt, 'Hist. d. l. Grande isle Madagascar,' Paris (1658), p. 166.

[†] This gifted and florid writer, in his 'Histoire Naturelle,' says:—"Cet oiseau diffère de notre huppe et de ses variétés, par sa grosseur; par son bec plus court et plus pointu; par sa huppe, dont les plumes sont un peu moins hautes à proportion, d'ailleurs effilées à peu près comme celles du coucou huppé de Madagascar; par le nombre des pennes de sa queue, car elle en a

Espérance," with description, and De Montbeillard's figure thereof, may therefore be looked upon as the first account of the bird worthy of credence. Latham's reference is nothing more than a modified translation of the preceding French author. Boddaert's few words stamp specific distinctness according to the present acknowledged mode of scientific nomenclature. Levaillant* led the van in an-

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douze; par la forme de sa langue qu'est assez longue, et dont l'extrémité est divisée en plusieurs filets; enfin, par les couleurs de son plumage. Il a la huppe, la gorge et tout le dessous du corps, blancs sans tache; le dessus du corps, depuis la huppe exclusivement jusqu'au bout de la queue, d'un brun dont les teintes varient et sont beaucoup moins foncées sur les parties antérieures; une tache blanche sur l'aile; l'iris d'un brun bleuâtre; le bec, les pieds, et même les ongles, jaunâtres.

"Cet oiseau, se tient dans les grands bois de Madagascar, de l'île Bourbon et du cap de Bonne Espérance. On a trouvé dans son estomac des graines, des baies de *pseudo-buxus*. Son poids est de quatre onces; mais il doit varier beaucoup, et être plus considérable aux mois de juin et de juillet, temps où cet oiseau est fort gras.

"Longueur totale, seize pouces; bec, vingt lignes, très-pointu, le supérieur ayant les bords échancrés près de la pointe et l'arête fort obtuse, plus long que l'inférieur, celui-ci tout aussi large; dans le palais, qui est fort uni d'ailleurs, de petites tubérosities dont le nombre varie; narines comme notre huppe; les pieds aussi, excepté que l'ongle postérieur, qui est le plus grand de tous, est très-crochu; vol, dix-huit pouces; queue, quatre pouces dix lignes, composée de pennes à peu près égales, cependant les deux intermédiaires un peu plus courtes, dépasse d'environ deux pouces et demi les ailes, qui sont composées de dix-huit pennes."

* The Count's countryman, Levaillant, proceeds as here quoted at length:--
"*Le Merops huppé.*—Buffon a décrit et figuré cet oiseau sous le nom de huppe noire et blanche du Cap de Bonne Espérance (no. 697 de ses planches enluminées); cependant, d'après ce qu'il en dit lui-même, il auroit du voir que cette espèce ne pouvoit être comprise dans le genre de notre huppe. Un oiseau qui en effet a la mandibule supérieure du bec échancrée du bout, la langue cornée, pointue, divisée en plusieurs filaments, et de la longueur à-peu-près du bec; qui a les pieds extraordinairement forts, relativement à sa taille, et les ongles grands et arqués, quoiqu'il dise qu'ils sont semblables à ceux de notre huppe, et qui enfin se nourrit de fruit, n'est bien certainement pas un oiseau qui appartienne au genre de la huppe, ni à celui des autres promérops, qui tous ont des caractères très différents, comme on l'a vu, et ne se nourissent que d'insectes. Pourquoi encore nommer cet oiseau *huppe noire et blanche*, lorsqu'il n'a pas un atome de noir dans son plumage, ainsi qu'on le voit, aux reste d'après la description que Buffon donne lui-même de ses couleurs, qui sont, comme il le dit, d'un blanc pur sur la huppe, dont toutes les plumes sont très-effilées sur la tête et tout le dessous du corps, y compris les couvertures du dessous de la queue? Le manteau est d'un brun clair et comme poudreux, plus foncé sur le dos et les ailes, marquées de blanc vers le milieu de leurs pennes. Le croupion et la queue, qui est carrément coupée du bout, sont de la couleur des ailes. Le bec, le pieds et les ongles sont d'un jaune citron, ainsi que la langue et le dedans de la bouche.

"Buffon assure que cet oiseau se trouve aux îles de France, à Madagascar, et au Cap de Bonne Espérance; mais ce qu'il y a de certain à cet égard c'est que je ne l'ai rencontré dans aucun des cantons du continent d'Afrique que j'ai parcourus, et qu'un habitant de l'île Bourbon m'a assuré que l'espèce y étoit très abondante, qu'elle vivoit en grandes bandes, fréquentoit les lieux humides, les marais; qu'on l'y nommoit Martin [=*Pastor*] et qu'elle faisoit beaucoup de dégât aux cafiers, dont elle étoit très-avide du fruit; ce qui prouveroit que cet oiseau doit avoir montré aux habitants beaucoup d'analogie avec les autres oiseaux auquels on donne généralement dans l'Inde le nom de Martin, pour qu'il en ait reçu le même nom. Pour peu, au reste, qu'on veuille faire

[illegible]

[illegible]

[illegible]

* [illegible] paragraph in the [illegible] Besides the facts [illegible] cimé avec le [illegible] pour le [illegible] promérops; [illegible] par son bec, [illegible] presque entièrement [illegible] M. Cuvier de dire l'article des [illegible] particulièrement au crave [illegible] antérieures de sa huppe, courtes et fines, se [illegible] en effet, ce caractère n'existe point chez [illegible] les promérops; de plus le tivouch diffère [illegible] à la queue, et la langue d'une [illegible] le queue n'est composée que de [illegible] et que sa langue est très-courte, obtuse et très-entière; ces deux [illegible] des narines m'ont paru suffisans pour le retirer du genre *Upupa*; il se rapproche davantage des promérops qui ont, dit-on, la langue presque aussi longue que le bec et douze pennes à la queue; mais ceux-ci ont les narines découvertes et les plumes du *capistrum* nullement couchées sur le bec. Les coracias étant donc les seuls qui présentent la réunion des attributs du tivouch, je me suis déterminé à le placer dans leur genre; cependant, si, comme le dit Montbeillard, sa langue est divisée par plusieurs filets à son extrémité, ce caractère ne se trouve point chez les coracias, dont la langue est seulement bifide à la pointe."—Tom. viii. p. 3.

† I select and partly translate such of Hartlaub's observations as properly form an historical appendix to the preceding extracts:—

"FREGILUPUS, Less.—*Fr. madagascariensis* (Sh.). Crista erecta alta, compressa, e plumis strictis subantrorsum versis composita, albida, nigricante infumata; tibiis, dorso, alis et cauda dilute fuscis; macula parva speculari alba; collo et gastraeo toto albis, illo supra subgrisescente; abdomine imo et subcaudalibus pallide fuscescentibus; subalaribus niveis; uropygio et tectricibus caudæ

study of the bird in skin, placed it among the Sturnidæ alongside of *Hartlaubia*. Schlegel * has indorsed the latter position in his ornithological contribution to MM. Pollen and Van Dam's work on 'The Fauna of Madagascar and Dependencies;' and I find him stating, in an earlier popular treatise†, that it is a kind of Starling. In the 'Genera of Birds,' G. R. Gray allows that the *Fregilupus* of Lesson may be a *Upupa*; but in his later 'Hand-list' he has totally altered this opinion, and made it come last in the subfamily Juidinæ, the Icteridæ having successive proximity. Lastly, and anew, Sundevall acquiesces in its Pastorine affinities, but in the light of an old friend with a new garb.

With reference to the Cambridge skeleton, I may here insert a note concerning it from Prof. Newton, to whom I had transmitted my drawings with the name *Fregilupus madagascariensis* upon them. He writes me:—"I am afraid I have led you astray as to the specific name of the bird. There is no doubt, I think, of its being the *Upupa varia* of Boddaert, whose specific name has accordingly priority of

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superioribus subrufescentibus; rostro longiusculo, gracili, subarcuato, acuto, pedibus et orbitis flavis, unguibus fuscis. Long. circa 10″, rostr. 1″ 8‴, al. 5″ 5‴, caud. 3″ 9‴, tars. 1″ 6‴, dig. med. 9‴."

Then follows synonymy. "*Hab.* Madagascar, Bourbon, Isle of France."

He further observes:—"In collections it is always of the greatest rarity. Wanting, for example, in the rich Museums of Vienna, Berlin, and Dresden. In Leyden, old and poor. Very beautiful and fresh in Florence and Pisa: three examples from Madagnscar. Also in Stockholm. The assertion of Bowdich, that '*Upupa capensis*' has been got at Porto Santo, arises naturally from a mistake (Excurs. Port. Sant. & Madeira, p. 93). [Here it may be stated that there is also a specimen in the Museum at Port Louis, Mauritius.—*Newton.*]

"I measured a beautiful new specimen in the Paris Museum from Bourbon. Entire length 11½″, beak 13½‴, wing 5″ 7‴, tail 4″ 10‴, tarsus 1″ 5¼‴. The only true systematic place of this bird is that long ago adjudged to it by Temminck and Wagler [that is, among the Pastors, though Hartlaub is wrong in quoting Temminck as an authority. See footnote p. 487].

"In this place I call attention to the known matter of fact, that the Indian *Acridotheres tristis* [Common Mynah] has, a long time since, been introduced into Mauritius and become domesticated. This species there also proves itself an indefatigable extirpator of grasshoppers &c."—*Ornith. Beiträge z. Fauna Madag.* pp. 53 & 54.

* Professor Schlegel's memorandum bears intrinsic value, being almost the last, certainly the most authoritative, testimony following Hartlaub, as bearing witness to the extreme rarity, if not total extermination, of the bird in question. My quotation is that contained in Pollen and Van Dam's volume, p. 104:—

"*Fregilupus madagascariensis.*—" Cette espèce est devenu tellement rare à la Réunion qu'on n'en a pas entendu parler depuis une dizaine d'années. Elle a été détruite dans toutes les parties du littoral, même dans celles des montagnes peu éloignées de la côte. Des personnes dignes de foi m'ont cependant assuré q'elle doit encore exister dans les forêts de l'intérieur près de Saint-Joseph. Les vieux créoles que j'ai consultés à ce sujet me disaient que, dans leur jeunesse, ces oiseaux étaient encore communs et qu'ils étaient tellement stupides qu'on les pouvait tuer à coup de bâton. Les créoles de l'île donnent le nom de Huppe. Ce n'est donc pas à tort qu'un habitant distingué de l'île de la Réunion, M. A. Legras, s'exprimait sur cet oiseau dans les termes suivants:—'La Huppe est devenue tellement rare qu'à peine nous en avons vu une douzaine dans nos pérégrinations à la découverte des oiseaux; nous avons même eu la douleur d'en chercher vainement un spécimen dans notre Musée.'"

† Handleidung der Dierkunde (1857), p. 338.

every other. It is, besides, unobjectionable, while both '*capensis*' and *madagascariensis* are misleading; for I do not believe the bird ever occurred either at the Cape or in Madagascar—most likely not even in Mauritius or anywhere else but Réunion (*olim* Bourbon). The Cape locality seems to be in part due to a mistake of De Montbeillard fostered by Levaillant, who, in such a matter, is universally and properly discredited; and as for its being found in Madagascar, that notion, I believe, arises from a wrong identification by many authors of Flacourt's 'Tiuouch,' which would appear to be a real *Upupa*." "There seems no reason why this should not have been the *Upupa marginata* of Peters, if, indeed, that be distinct from *U. epops*."

The several generic and specific names heretofore adopted by ornithologists are regarded by all as synonymous, subsequent writers choosing that most suitable to their views. There is one exception, however, which I cannot pass in silence. Dr. Vinson, in his paper "De l'Acclimatation à l'île de la Réunion," only trippingly alludes to the disappearance of the bird in question from the island; but he nevertheless transmutes its scientific cognomen into *Fregilupus borbonicus*, appending his reasons in a footnote, which I give below in full *. Prof. Giebel, however, in the last issue of his in many ways valuable 'Thesaurus' †, improves the aspect of matters. Under the genus *Fregilupus two* species are duly recorded:—(1) *F. borbonicus*, Vinson; (2) *F. varius*, Gray. This slip is barely excusable in one whose erudition and knowledge of nomenclature should have guided him otherwise. Though possibly justified by supposed better reasons, Sundevall's recent change of generic title into *Lophosurus* ‡ (= Crested Starling) is likewise, I think, not entitled to recognition. Although it may be judicious that future names should have proper derivation and be well compounded, yet, if we are pedantically to root up all acknowledged landmarks, we may be lost in the surf-confusion of terms already too nnmerous. Moreover we should not lose sight of the intermediate forms every day encroaching upon and demolishing supposititious boundaries not to be girded by mere names.

THE SALIENT POINTS OF THE SKELETON.

Sterno-costal framework.—The lateral laminæ of the double-notched breast-bone are delicate and transparent; the keel, rostrum, xiphoid bars, and edges of the rest of the bone thicker and more solidified. The notches are fair-sized, the bars only of moderate strength, but very distinctly pedate, and a grade shorter than the mid sternum. The latter is broadish, and abruptly truncate posteriorly. The inferior margin of the keel is straight, its anterior border widely bayed, the lower termination being more angular than rounded. The rostrum is sharply upturned, and terminally widely forked; the costal processes are both broad and high. Within, the sternum is shallow and widish.

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* "C'est à dessein que je spécifie la huppe de l'île Bourbon sous le nom de *Fregilupus borbonicus*. On ne saurait lui donner avec Reichein [Reichenbach ?], le nom de *madagascariensis*, puis qu'elle n'a jamais été trouvée à Madagascar, ni avec Gmelin, celui de *capensis*, puis que Levaillant affirme qu'elle n'existe pas au cap de Bonne Espérance. Donc c'est l'épithète *borbonicus*, qui seule lui convient." (Bull. Soc. Acclim. 1868, tom. v. p. 627.)

† Vol. ii. 1874, p. 192.

‡ Försök till Fogelklassens (Stockholm, 1872), p. 40.

There is a large inflected interclavicle; and whilst the narrowly U-shaped furcular limbs throughout are slender, their upper ends are outspread. The shaft of the coracoid is rounded, long, and not thick, its lower sternal end broadening gradually with an outer, thinned, sharp margin; its scapular extremity with a moderate expansion. The scapula is sabre-shaped and of medium width.

On each side there are only seven vertebral ribs extant in the specimen; but, from appearances, I surmise that there has been an additional riblet anteriorly. The five front ribs have recurrent processes; in the hindermost *two* there are none. The last rib of all has a delicate spinal end; the first does not reach the sternum; neither does the last, though it is fastened to the sixth. Thus there are only five osseous sternal ribs which articulate with the sterno-costal process, and as many which expand at their upper vertebral angles. In form the thoracic cavity is high behind, the reverse in front, and from side narrow and subcompressed.

Pelvis and Spine.—The pelvis is narrow in front, moderately broad in the middle (postiliac region), and wide at the lower (pubo-ischial) processes. The præ- and postacetabular lengths are subequal, advantage, if any, being in favour of the latter. The anterior iliac blades are considerably deflected; but the rear of the pelvis dorsally is full and convexly depressed. The descending ischial plates have a rather perpendicular set, and at the ischiatic foramen the postilium overhangs considerably. The tenuous pubic rods broaden terminally, and are in apposition with and extend further than the tuberosity of the ischium. The renal excavations are each deeply scooped, and exhibit only a trace of transverse partition.

In the neck there are 11 vertebræ, or 12 if that possibly carrying a riblet be included; in the back 7 or 8 with that anchylosed to the sacrum; of sacral 7 or 8; and of free caudals 8. Expressed in formula: C. 11 (12?), DL. 7 (8?), S. 7 (8?), Cd. 8, = 34 (35?). Neural spines obtain in 2nd, 3rd, 4th, and 5th cervicals. 1st to 4th show single median hæmal spines, absent in those that follow, but reappearing in the 11th. The intermediate cervicals possess inflected plates, which defend the carotid artery. Recurrent spicules commence on the 3rd, and increase in length and strength almost to the hindmost neck-vertebræ. The 1st and 2nd dorsals have barely appreciable neurapophyses; those behind have them well developed. Only three or four of the foremost dorsals have inferior mesial spines. Sacrum with a solid columnar body; ragged-edged perforations mark intertransverse vertebral divisions. The six anterior free caudals are tolerably uniform, the penultimate and pygostyle are more adnate, though not anchylosed.

Cranio-lingual formation.—The bill, *i. e.* premaxillary region to the rear segment or orbitocranium, is nearly as 4 is to 3 in length. The skull generally, both from above and in profile, has a long, narrow wedge-form. The brain-area is only very moderately high, being indeed rather depressed and broad on the top. The triangular narrowing of the bill, though regular, is decidedly most marked and compressed from the nostrils forwards.

The orange-coloured, horny, mandibular case having been retained on one side, enables me to state that at the apex, above and below, there is faint indication of a terminal, shallow notch; whilst behind there is slight roughening of the free margins, this, however, possibly being due to drying and wear. As far as appearances go, the ends of the mandibles meet together in a point, and it seems the lower horny case has greater depth than the upper. The membranous orifice of the nostril is only 0·15 inch, or 2 lines, in antero-posterior diameter, altogether being a small, low-set, narrow, oval aperture, situated 1·1 inch from the tip of the horn-clad rostrum.

Turning to the bones of the lower base, we observe that the præmaxillæ and palatines coalesce anteriorly, and with shallow concavity. The palate, posteriorly, is open, and only covered by membrane in the fresh state. The inward shelving narrow palatal rods terminate posteriorly in oblique-set outer plates, whose free ends are emarginate, with short, rounded, external angles. The inner half-twisted and vertically directed palatal laminæ reach considerably further back, and run beneath the pterygoid abutment, leaving, however, a middle cleft of medium width and depth. The fair-sized vomer is cleft behind, truncate in front; and the septum narium is apparently unossified. The maxillo-palatine of the one side was injured; but in the other I made it out to be a narrow pedicle directed towards the middle and sides of the vomer, not crossing that bone, or united to its fellow of the opposite side. The pterygoids have shafts and ends moderate in their proportions, as is the length of each bone. Posteriorly they possess an upward-directed tabular process lying within the root of the front limb of the quadrate. The jugals are very delicate bony rods, and they lie against the outer lower border of the lachrymals, but not beneath them. As regards the quadrate, it is stout and high, the lower articular knuckles being relatively well pronounced.

The following are the noteworthy points in the shape and disposition of the bones, as examined on the upper posterior and lateral superficies of the cranium. The tapering præmaxillæ have a sensible curvature, narrow, but dorsally rounded, with a slight eminence at rear of nares. There is a prefrontal depression; a tuberose swelling above the foramen magnum, with muscular impressions on either side. This occipital face is widely arched, and smooth beyond. Temporal groove shallow; orbit of moderate circumference; interorbital septum with two large fenestræ; lachrymal coalescent with ethmoidal expansion.

I can substantiate what has been averred of the tongue. Fig. 10. Plate LXII., shows its upper surface, along with the hyoid bones. In this specimen it is above an inch long, and seems to have reached quite halfway along the symphysial union when ordinarily at rest in the mouth. It is apparently horny in structure, sagittate in shape, but elongate; the margins slightly raised, so as to produce shallow grooving. Towards the tip the borders are frayed, and, terminally, slightly forked. The edges of the posterior bifurcation are minutely crenate. Judging from the under aspect, convex and longitudinally furrowed, I believe the muscular structure to have been such that rapid protrusion and withdrawal of the tongue has obtained. With regard to the hyoid bones, each is lengthened and slender; the urohyal is spatulate and tipped with cartilage. The trachea, widest above, tapers very gradually towards the syrinx. Its osseous rings are not simple and uniform, but composed of a series of half-rings, narrow at one extremity and broad at the other; these dovetail with one another in front and behind. What remains of the lower larynx shows it to have been of moderate size.

Limb-construction.—The right leg of this Cambridge skeleton has not been deprived of its integument, which latter, though dried and shrunken, nevertheless exemplifies its scaly character. The tibio-tarsal joint is here sparsely clothed with short feathering, which does not extend beyond the calcaneal elevation. Six scutes cover the tarsus anteriorly, the upper two being much narrower than the three between, which are remarkably long. The three topmost linear divisions are transverse in direction compared with the lowermost, which run obliquely outwards and downwards. Posteriorly the tarsus is smooth, or with a faint appearance of hexagonal scutellation, doubtfully produced by drying of the specimen. The dorsal scutella of the toes are numerous, short, and pronounced. The dermal tracery of the sole of the foot bears a minutely dotted or papillary character.

Both wing- and leg-bones are comparatively strong; but a striking preponderance results in the tibio-tarsal segments, as the subjoined measurements testify:—

	Humerus. in.	Ulna. in.	Metacarpus. in.	Mid phalanges. in.	Total length. in.
Wing........	1·5	1·8	1·0	0·6	4·9

	Femur. in.	Tibia. in.	Tarsometatarse. in.	Mid-toe phalanges. in.	Total length. in.
Leg	1·4	2·6	1·8	1·45	7·25

The humerus has a stout, straight, round shaft. Its expanded head has a very large double fossa or divided pneumatic entrance. The inferior inner condylar process is well marked and descends low; a tubercle surmounts the external one. The ulnar shaft is almost devoid of elevations for quill-feathers, but is strong notwithstanding. The radius, on the contrary, is compressed and slender, and its head comes to a level with the outer articular facet of the ulna. Metacarpal and phalangeal pieces are tolerably solid.

Femur characterized by its relative strength, but more particularly by the prominence of its outer inferior condyle and deep groove for tendon behind. As to the tibia, the production of its cnemial crest, [illegible] [illegible] and [illegible] of the [illegible] ridge and tubercle, capacity of the femoro-extensor [illegible], large shaft for flexor [illegible] attachment, [illegible] [illegible] and [illegible] ridge, as well as strength of the entire bone, altogether denote a muscular power of leg adapted to terrestrial more than climbing or perching habit. This limb-strength is likewise well expressed in the tarsus, whose robust triangular shaft is deeply furrowed to accommodate the tendinous cords. The calcaneal eminence is drilled by five foramina. The inferior [illegible] trochlea is [illegible] and [illegible], the outer laterally compressed, and about equal to the inner, which has an oblique set for the reception of the greatly-sized metatarsal element. The foot has the more usual phalangeal numbers 2, 3, 4, 5, and is 4-toed, the ungual phalanges being strong and curved. The 2nd and 4th digits are subequal in length, the 3rd considerably longer than either, the 1st or hind one of medium length, but by far the stoutest of all.

SUPPOSED ALLIANCE TESTED BY THE SKELETON.

With the Upupidæ.—In my communication upon these birds in 'The Ibis' I indicated why, osteologically, *Fregilupus* can no longer be accorded a place among that group. Indeed Levaillant's, Vieillot's, Hartlaub's, and Schlegel's determination, from exterior characteristics alone, are sufficient proof of distinctness from the Hoopoe tribe, and as such accepted by the later classific writers on ornithology. To what I have hitherto stated (*l. c.*), if I add the Passerine feature of multiple calcaneal foramina, the totally different nature of the mandible, notwithstanding its mask of elongation and slenderness, the humerus with its large, bifid pneumatic openings, its round, not flattened, shaft and condylar tubercles, the differentiated distal bones of both wing and leg—then surely such multiplicity of evidence denotes that the skeleton of *Fregilupus* trenchantly recedes from the Hoopoe members, and, as to be shown, correspondingly draws towards the Starling family.

With the Sturnidæ.—The genera of this family, with which I have compared each separate bone side by side with the subject of my paper, are *Sturnus, Pastor,* and *Gracula.* Taking these in the order mentioned, that of the Common Starling, *S. vulgaris,* precedes. With this species of *Sturnus, Fregilupus* agrees in the general pattern of the sternum; but the former has more delicate xiphoid bars and relatively larger spaces, a deeper keel and longer rostrum, a narrow pointed angular, and not broad rounded scapula. In *Sturnus* the antiliac blades and ischial production are relatively shorter than in *Fregilupus.* With reference to the lower jaw, the type of both is manifestly similar, and in this respect very unlike the preceding groups. The postarticular angle is more acuminate in the Starling, the symphysial, or so-called dentary, region relatively deeper, broader, and shorter than in the Réunion bird. Again, in the cranium both exhibit a certain fulness of brain-region, but wanting the bilobed character of *Upupa*; in the latter the interorbital breadth is great, in the two former much narrower. Whilst *Fregilupus* and *Sturnus* have extensive prænares, these are reduced by ossification in *Upupa*. The much-lengthened tenuous præmaxillæ of the latter deceive at first glance; for, notwithstanding a certain beak-abbreviation in the Common Starling, its palatal construction is in reality nearer our bird. Admitting general and numerous resemblances in the base of the skull of *Fregilupus* and *Sturnus*, the latter is nevertheless unconformable in these particulars:—flatter, shorter præmaxillæ, and relatively greater width at their maxillary junction; proportional slenderer palatine rods, plates, and maxillo-palatines; preorbital processes better-developed; auditory cavity less open; occipital protuberance higher, digastric fossa wider*, and, hence, ridged occipital outline narrowed and lofty. In the shapes of the limb-bones the two pretty much agree. The Starling, however, shows a deeper fossa above the internal humeral condyle, deeper extensor metacarpal sulci, but diminutive osseous bridge; again the muscular impressions and ridges of leg-bones are weaker.

In *Pastor* (*P. griseus*) the breast- and shoulder-bones present closer resemblances; the pelvis, in detail, still more agrees with that of *Fregilupus*; its wing-bones, however, accord more with the points indicated in *Sturnus*; but, on the contrary, its leg-bones have features more after *Fregilupus*, *e. g.* inequality of tarso-digital knuckles. These characteristics apply also to *P. cristatellus*. The skull of the latter specimen examined by me was in a better condition for comparison; and to it I specially allude. Its premaxillary to cranial length is as 10 to 11, in *Fregilupus* 15 to 12. Its prefrontal and naso-maxillary breadth are relatively greater than in the latter. With these exceptions, the differentiation is so graduated as not easily to be expressed in words. Cut short the beak of *Fregilupus*, compress slightly its root, and elevate the parietal by a mere shade, and you convert it into a species of *Pastor*. Furthermore, the tongue of *P. ialla* (*Sturnopastor*, Gray) I have found to resemble that of *Fregilupus*; only it is about one third shorter.

In *Gracula*, *G. intermedia* (*Eulabes*, Cuv.), there is a wide remove. Its sternum, shoulder-girdle, and pelvis doubtless retain the main characters of *Fregilupus*; but deviation occurs in the limb-bones in several points: for example, there is but one pneumatic foramen, a Corvine peculiarity. But the skull manifests the greatest change of type—this by its remarkable breadth to length, elevated bossy prefrontals, ossified nasal septum, and a number of other particulars needless for me to enter into.

As respects proportions of limb-segments in the above three genera of the *Sturnidæ*, I have placed them opposite those of *Fregilupus* in a tabular form. From these figures it results that *Pastor* simulates and comes nighest the latter, tarsal to metatarsal even being greater.

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* "Characteristic of the Sturnidæ," Garrod, P. Z. S. 1872, p. 646.

Proportional Lengths of the Limb-bones of Genera of the Starling Group.

	Fregilupus varius.	*Pastor griseus.*	*Sturnus vulgaris.*	*Gracula intermedia.*
Ulna to humerus	120 : 100	110	114	127
Metacarpus to humerus	66 : 100	57	76	73
Mid digit to humerus	40 : 100	45	57	50
Tibia to femur	135 : 100	182	173	153
Tarso-metatarse to femur	138 : 100	127	105	105
Mid anterior toe to femur	103 : 100	104	93	92
Humerus to wing	30 : 100	33	28	28
Ulna to wing	36 : 100	35	33	36
Metacarpus to wing	20 : 100	18	23	21
Mid digit to wing	12 : 100	14	16	14
Femur to leg	19 : 100	19	21	23
Tibia to leg	36 : 100	35	36	34
Tarso-metatarse to leg	25 : 100	25	23	22
Anterior mid toe to leg	20 : 100	20	20	21
Femur to humerus	93 : 100	90	90	90
Tibia to ulna	144 : 100	148	137	108
Tarso-metatarse to metacarpus	150 : 100	200	125	118
Mid ant. toe to mid dig. of wing	241 : 100	209	150	166
Leg to wing	142 : 100	148	123	113

With certain other Families and Genera.—Likeness to *Pastor* obviates prodigality of comparison; but I nevertheless throw out a few desultory remarks. Levaillant's introducing *Fregilupus* into the company of his "Promérops et Guêpiers" insinuates rather than propounds cognation. Possession of a long beak certainly does not warrant their keeping company when incongruity in other particulars dissociates. As regards the Grand Promerops (*Epimachus speciosus*), a study of its cranium shows small oval nares, lofty, broad maxillo-nasals, prepalatine ossification, and sundry other differentiations. The skull of the 12-wired Bird of Paradise, *Seleucides alba*, substantiates these distinctions; and, moreover, in its sternum, pelvis, and construction of various parts of its limb-bones it offers deviation of type. As to *Paradisea* (*P. minor* and *P. apoda*), quite as telling osteological discrepancies obtain. What between these and external characters, alliance of *Fregilupus* to the Paradiseidæ, at best, is of a secondary or tertiary grade.

The tenuity and elongation of præmaxillæ exhibited by the Meropidæ is but a seeming analogy, not borne out by the entire conformation. From this group our bird stands remote.

The quotation from Dict. d'Hist. Nat. (*vide* footnote, p. 478) gives, in Vieillot's own words, the attributes by which he affines *Fregilupus* with *Coracias*. Although the characters he mentions undermine Upupine alliance, yet a study of the skeleton does not support Coraciine affiliation. The skull, sternum, pelvis, and limb-bones all justify separation. In brief, *Coracias* is a coccygomorph, *Fregilupus* a coracomorph; and with this I dismiss the idea of union.

Among the Corvidæ I select *Fregilus* (*F. graculus*) and *Gymnorhina*

(*G. organica*) as sufficiently diverse examples—the former genus, moreover, evidently being that intended by Vieillot, and not the true Rollers, *Coracias*. In the Chough, compared with *Fregilupus*, the rear of the skull is full and globular, the beak straighter, shorter, and considerably wider, but the prefrontal is relatively narrower and with scarcely any interorbital depression; lachrymal partially free; maxillo-palatines almost overlap; postpalatine border without emargination. Thus, what between height, breadth, &c., much less cranial resemblance obtains than in *Pastor*; added to which a shorter triangular tongue, humerus with single pneumatic foramen, præilium long and eflect or horizontal, lengthened pubis, shorter toes, &c., and their relationship widens. In the Tasmanian Piping Crow still more numerous differences present themselves, which it is needless to recount; suffice it to say, this Streperine section of the Crow veers quite away from our bird.

Reverting a moment to allies of the Starling family, I may mention I compared *Fregilupus* with the skeleton of more than one species of the genus *Acridotheres*, to which it offers fewer points of union than to *Pastor*. Of the Lamprotornithinæ or Juidinæ I more particularly paid attention to the osteology of *Lamprotornis æneus* and *Scissirostrum pagei*. Both, particularly the latter, evince such divergence as suggest transition of type. The genus *Psaroglossa* and subgenus *Hartlaubius* (the bones of which I have not seen) alone intervene between *Scissirostrum* and *Fregilupus*, according to the late Mr. G. R. Gray.

SEQUEL AS TO THE FRATERNITY OF *FREGILUPUS*.

The study of the skeleton of this rare Réunion bird most unquestionably does not favour the idea of its being allied to the Hoopoes, nor to the Fregiline section of the Crows, other than by very subsidiary links. Its osseous structure is far from complying with that of the Bee-eaters, nor does mere beak-production draw it within the fold of the tenuirostral division of the Paradise-birds. With members of the Starling family it agrees in a host of particulars, and notably with the genus assigned it by Wagler. Yet it bears such consistent characters, that, as a genus, *Fregilupus*, it hails close proximity to *Pastor* (*P. roseus*), without being amalgamated as a species of the latter. It is also related to *Sturnus* and mayhap *Sturnopastor**, but with a tincture of dilution. Even as far as bony build of itself goes, it has an affinity with the Orioles; but these, as with the Mynahs, Choughs, and Glossy Starlings, &c., are outlying relations not at present to be included within the narrowed focus, nor as impinging with direct continuity. The life-history and soft anatomy of *Fregilupus*, unfortunately, are imperfectly known; but, as far as outward characteristics and habits weigh, the balance sways towards the Pastoridæ. Sundevall's term, Crested Starling, to *Fregilupus* is apt, but equally applicable to species of *Pastor*. If the present view of affinities be the correct one, additional interest is attached to the Mascarene form in its geographical isolation, distinctive individuality, and withal intermediation, one might say, between Asiatic, European, and African Sturnidæ. It partially supports those who uphold the Madagascar group as a faunal centre, but it no less confirms those who promulgate an eastern avian connexion with the said islands.

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* The so-quoted *Pastor capensis*, Temm., which by Hartlaub and others is given as a synonym of *Fregilupus*, I find is a mistake. In Temminck's 'Tab. Méth. Planches Col.' i. p. 12, the bird referred to "*Etourneau pie du Cap*," viz. pl. 280 of Buff. Pl. Enlum., is the *Sturnopastor contra*, Linn., a true Indian form.

DESCRIPTION OF THE PLATES.

Plate LXI.

Fig. 1. Drawing of the skeleton of *Fregilupus varius* in the possession of Prof. Newton at Cambridge. Specimen labelled "*Fregilupus varius* ♂, Réunion (J. P. Verreaux), No. 974a, Osteoth. Newt. MS. Cat." Sketched of natural size, and with the right foot and tarsus covered by its integument.

Plate LXII.

Fig. 2. Tongue and hyoid bones, from above. This and all the figures, excepting Nos. 23 and 24, are of natural dimensions.
3. Sternum and right half of the shoulder-girdle, underview.
4. Left ulna, on inner or flexor aspect.
5. Humerus of left side; its inner aspect.
6. The same bone; outside view.
7. Its posterior face, showing double fossa of pneumatic cavity &c.
8. Upper extremity of the left humerus; its anterior surface placed superiorly.
9. Lower humeral end; anterior surface situated inferiorly.
10. The lower jaw, from above.
11. Lower or palatal surface of skull.
12. Left tibia and fibula, from behind.
13. Inner aspect of the left tibia.
14. Front surface of left tibia and fibula.
15. Upper articular ends of the same bones.
16. Lower tibial articular end.
17. Metacarpus and phalanges of left wing.
18. Occipital surface of skull.
19. Cranium, from above.
20. Sacrum and pelvis, upper view.
21. Left metatarsal ossicle; its inner free surface.
22. Exterior face of the same bone, or that in apposition with tarsus.
23. The upper articular end of left tarsus, represented twice the natural size.
24. Lower end of same bone, also enlarged two diameters.
25. Front surface of the left tarsus, entire.
26. Posterior aspect of same bone.
27. Its inner surface.
28. Left femur; front view.
29. Posterior surface of same.
30. Upper end of the femur.
31. Lower end of left femur, anterior surface placed uppermost.

[P.S. In Plate LXII. some of the figures, *e. g.* fig. 10, show a want of symmetry not present in the specimen. For this the artist on stone is free from blame; my original drawings, I find, have led to the exaggeration in question.—Aug. 1874.]

14. A further Communication upon certain Gigantic Cephalopods recently encountered off the Coast of Newfoundland. By W. SAVILLE KENT, F.L.S., F.Z.S.

[Received May 18, 1874.]

In my communication to the Zoological Society, dated the 17th of February last, a description is given of a gigantic Cephalopod lately encountered in Conception Bay, Newfoundland, and of which a tentacle 19 feet long is preserved in the St. John's Museum. Evidence is adduced at the same time of an enormous arm preserved in the British Museum and which probably belonged to an animal of equally large proportions. It is likewise proposed, in the same communication, to provisionally distinguish the Newfoundland example by the name of *Megaloteuthis harveyi*, both in acknowledgment of the services rendered to science by the Rev. M. Harvey by his energetic steps taken to preserve so valuable a trophy, and in consideration of the apparent absence of grounds for believing the same to be either generically or specifically identical with any form of its class hitherto described. In a short addendum, a brief announcement is made of a second colossal example, which became entangled in a herring-net in Logie Bay, Newfoundland, a few weeks later, and of which steps had been taken to secure the entire body.

Since the date of this communication additional evidence has been produced in association with these two Newfoundland examples, as also with reference to other colossal specimens previously encountered in the same vicinity, which enables us to indicate, with greater certainty than heretofore, the position among other representatives of their tribe that these oceanic monsters probably occupy. The most important evidence being associated with the specimen from Logie Bay, we propose to make it the subject of our first attention. This example, as already observed, was enclosed in a herring-net some three miles from St. John's, the creature's arms becoming so entangled in the meshes of the net that its power of resistance was almost entirely annihilated; it nevertheless required the united efforts of three fishermen to finally overcome it; and it was not until the monster's head was severed from its body, that they were enabled to take possession of their prize. When brought to shore this body or mantle-sac was found to measure over 7 feet, the sessile arms 6 feet, and the two tentacula as much as 24 feet in length. Photographs of these separate portions were taken; and the one embracing the head with the arms and tentacles, which gives an excellent idea of the gigantic proportions of this Cephalopod, was reproduced as a wood-engraving in the 'Field' for January 31st *. The structure and mode of arrangement of the suckers on the tentacular club in this specimen, as shown by Mr. Harvey's descriptive text and the photographs accompanying it, indicate that both this and the Conception-Bay example are specifically identical, while, at the same time, the much fuller details now made known to us through this last capture greatly facilitate our efforts towards its correct appreciation. Particular interest attaches itself to the fact, recorded in association with the tentacular club of this latter specimen, that an outer row of minute suckers supplements the two central rows of larger ones on each side. These small suckers alternate with the larger, and, while of such inconspicuous size as to have escaped notice in Mr. Harvey's first report, are of especial importance inasmuch as they indicate that the animal is most nearly allied to the genera *Loligo* and *Ommastrephes*. So closely indeed is the formula of the tentacular club, in addition to all other essential points, now shown to correspond with certain species of *Ommastrephes* that it will be evidently desirable to retain it in that genus, thus avoiding the creation of a new generic title, as previously proposed, and which would have been requisite had the two rudimentary rows of suckers on the outer margin of the tentacular club been wanting, as the earlier description seemed to indicate. The specific distinctness of this form, however, appears to be still more clearly indicated by the more extensive information recently eliminated.

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* Also in an article on "Gigantic Cuttlefish," by the present author, in the 'Popular Science Review' for April 1874.

Prof. A. E. Verrill, in a very interesting communication to the 'American Journal of Science and Art,' reprinted in the 'Annals and Magazine of Natural History' for March last, brings forward, in addition to the accounts of the two monsters here especially mentioned, reliable evidence concerning several other Cephalopods of gigantic size encountered on the same coast-line within the last few years. Having examined the beaks and other portions of several of these, Prof. Verrill is of the opinion that they include two species respectively identical, in all probability, with Prof. Steenstrup's *Architeuthis dux* and *Architeuthis monachus*. Our information, however, relative to both the genus *Architeuthis* and the two forms referred to it, is at present so limited, that considerable difficulty is associated with the establishment of this identity. This difficulty is, furthermore, greatly enhanced by the very antagonistic evidence concerning these species adduced by different authorities. Thus, in the absence of means of access to Prof. Steenstrup's original description of the genus *Architeuthis*, the present author accepted the authority of MM. Crosse and Fischer, who in their well known 'Journal de Conchologie' (vol. x. 1862, pp. 129 & 130), state that the generic title was instituted by its founder in the year 1856 for the reception of three gigantic Cephalopods, two of which were captured on the coast of Iceland in the years 1639 and 1790, and of which popular record alone remains; to these Prof. Steenstrup provisionally applied the title of *Architeuthis monachus*. A third was stranded on the coast of Jutland in 1854, and upon the pharynx and beak of this, the only parts preserved; the same authority founded his species *Architeuthis dux*. Evidently assuming that the genus *Architeuthis* had not been sufficiently characterized for reidentification, MM. Crosse and Fischer, in this same article, bestow upon the specimen encountered by the French corvette 'Alecton' between Madeira and Teneriffe the name of *Loligo bouyeri*, as stated in my earlier communication. Among other evidence brought forward by these same authorities, allusion is made to some fragments of a very large Cephalopod contained in the Amsterdam Museum, described and figured by M. Harting in the Memoirs of the Royal Academy of the same city.

Having had occasion to refer lately to this contribution of M. Harting's, its value was found to be considerably beyond what was anticipated from the very brief notice taken of it by Crosse and Fischer, its bearings upon the genus *Architeuthis* being especially important. A description, with three fine quarto-plate illustrations, is here given of fragments of two separate examples—No. 1 being a pharynx and beak with several suckers preserved in the Utrecht Museum, but of which no record has been preserved, and No. 2 comprising also a pharynx and beak with the terminal portion of a sessile arm taken from the stomach of a shark in the Indian Ocean. The fragments of this last example being demonstrated by M. Harting to belong to one of the armed Calamaries, *Enoploteuthis*, No. 1 alone demands our present attention. This M. Harting identifies with Prof. Steenstrup's *Architeuthis dux*, he having had the advantage of corresponding with that eminent authority, and having, moreover, compared the fragments described by himself with the plates illustrative of that species prepared, but unpublished, by Prof. Steenstrup. In the same communication M. Harting expresses his opinion that there is not sufficient ground for the institution of this genus *Architeuthis*, and refers Prof. Steenstrup's typical *Architeuthis dux* to a species of *Ommastrephes*, most probably identical with *O. todarus*, D'Orb., and with which form the contour of the mandibles and the armature of the suckers strikingly accord. This species, however, is distinguished from all known cuttlefish by the remarkable feature of having its two longer tentacular arms covered with suckers, arranged in four rows, throughout their length; and in the absence of any evidence concerning these arms, the positive identification of this form with Prof. Steenstrup's species could not be arrived at.

We must now return to the evidence adduced by Prof. A. E. Verrill in association with the Newfoundland specimens and with fragments of other examples that have fallen under his personal notice. In all, Prof. Verrill makes mention of five different individuals, four of which, including the two examined by the Rev. M. Harvey, he anticipates to be identical with Steenstrup's *Architeuthis dux*, and the remaining one to represent the less-known *A. monachus*. The jaws of this last example are preserved in the Museum of the Smithsonian Institution, and are described by Prof. Verrill as being very thick and strong, with a decided notch and prominent angular lobe on its inner margin; from a photograph of the same, submitted to him, Prof. Steenstrup also concurs in the probable identity of the example with his *A. monachus*. Out of the four remaining, which Prof. Verrill refers to *A. dux*, he describes a pair of jaws (also preserved in the Smithsonian Institution) as being much more slender than those of the last example mentioned, and entirely wanting its deep notch and prominent angular lobe. This description, however, clearly indicates that neither this particular individual nor the three others associated with it, if of the same species, can be identical with *A. dux*, as in the latter it is distinctly shown, both by M. Harting and by Prof. Steenstrup's own figures, that a distinct notch and prominent angular lobe exist. Both *A. dux* and *A. monachus*, indeed, seem to approach one another so nearly in the character of the mandibles (the only portions yet available for comparison), that it is difficult to refrain from the suspicion that they represent one and the same species.

If, again, M. Harting is correct in his identification of *Architeuthis dux*, Steenstr., with *Ommastrephes todarus*, D'Orb., we have further conclusive evidence that the Newfoundland examples are distinct from that form, their tentacular arms presenting the character of the ordinary cuttlefish, and wanting the anomalous feature of these organs already observed of D'Orbigny's species.

It would appear, then, that the individuals encountered in Conception and Logie Bays, represented in the St. John's Museum by a tentacular arm and an entire specimen, and which, in a previous communication, we provisionally proposed to distinguish by the title of *Megaloteuthis harveyi*, belong, if identical (as Prof. Verrill surmises) with the three examples that have fallen beneath his notice, to a species distinct from either representative of the genus *Architeuthis* (even should two exist) as characterized by Prof. Steenstrup, or from any other species of the same order recognizably described. At the same time it would seem, from the evidence of M. Harting and others, with the further testimony adduced from the Newfoundland examples, that the two species of *Architeuthis*, Steenstr., cannot be separated from the genus *Ommastrephes*, D'Orb., of which they are merely gigantic representatives. Concerning the species represented by the magnificent example and fragment in the St. John's Museum—in the seeming absence of characters that identify it with any form hitherto described, it appears desirable to retain for it the same specific title proposed in our earlier communication, and thus to distinguish it as *Ommastrephes harveyi*, the arrangement of the suckers on the tentacular club, already enumerated, constituting a sound specific diagnosis. As, however, these examples, with other material of a kindred nature, have had the good fortune to engage the attention of so eminent an authority as Prof. A. E. Verrill—a circumstance of which I was unaware at the time of penning my first communication, we may confidently leave it in his hands to demonstrate to us the many essential details yet wanting to complete our perfect knowledge of these noble specimens, and to clear up the several apparent discrepancies with which, owing to the previous paucity of material, the literature of this most interesting subject has been encumbered.

With the above end in view, I wish to place on record the results of a recent and more minute examination of the colossal arm preserved in the British Museum, which may prove of service to Prof. Verrill for comparison with the fine series to which he enjoys facility of access.

The length of this arm, from one extremity to the other, is just 9 feet; the circumference at the base 11 inches; and from this it gradually decreases, terminating in a fine point. The suckers are arranged in two rows throughout the extent of the arm, numbering, approximately, 150 to each row, or a total of 300 to the whole organ. Forty-three suckers only are stationed on each side in the first or proximal half of the arm; one hundred on each side occupy the whole length, with the exception of 14 inches, this smaller length including the remaining fifty on each side, which are very minute and crowded together. The comparative distances between the suckers throughout the whole length in each row are as follows:—between the first and second sucker, 1⅓ inch; halfway up the arm, 1 inch; at three quarters of the entire length, ½ inch; and within six inches of the distal extremity, ¼ inch. The relative diameters of the suckers at similar distances are:—at the base, extreme outside measurement ¾ inch, inside measurement of corneous ring ½ inch; and, those suckers a little past the first few being the largest, halfway down ½ inch outside and ¼ inch inside measurement, at three quarters length ¼ inch, and at 6 inches from the extreme point ⅛ inch outside measurement, gradually diminishing from here to the size of a pin's head.

The shape and structure of the suckers upon this British-Museum specimen agree with those of *Ommastrephes todarus* as given by D'Orbigny, corresponding also with those figured by Harting, referred by him to the same species, and anticipated by the same authority to be also identical with Prof. Steenstrup's *Architeuthis dux*. More minutely they may be described as hemispherical in shape, the stalk or peduncle being attached laterally at the base of the hemisphere, the point of insertion of the same in the cup being marked by a conspicuous pit-like depression. The horny ring is obliquely set, and much deeper at the side opposite the insertion of the stalk; the inner margin is serrated; and in most examples the serratures bordering the deeper side are considerably larger than in the other portions of the circumference; in some instances the serratures, except at the particular point mentioned, are altogether aborted, having the inner margin of the ring quite smooth; in other examples, and more especially among the larger suckers, the teeth or serratures are equal or subequal. The average number of the teeth of the largest rings is twenty.

We may further mention, then, in conclusion, that the arm preserved in the British Museum belongs to a species apparently identical with *Ommastrephes todarus* of D'Orbigny, which, according to M. Harting, is synonymous with Prof. Steenstrup's *Architeuthis dux*. A comparison of the form and armature of the suckers of this example with the Newfoundland series will therefore be of much service towards ascertaining whether any identity exists between the two, although, from the evidence already adduced, this does not seem probable. It is particularly worthy of note in this connexion that Mr. Harvey attributes approximately but 100 suckers to a single sessile arm of the St.-John's specimen, while the example in the British Museum bears fully 300, a number considerably in excess, even after making allowance for the difference in length.

November 3, 1874.

Dr. Günther, F.R.S., V.P., in the Chair.

The Secretary read the following reports on the additions to the Society's Menagerie during the months of June, July, August, and September 1874:—

The total number of registered additions to the Society's Menagerie during the month of June was 226, of which 47 were by birth, 63 by presentation, 43 by purchase, 6 by exchange, and 67 were received on deposit. The total number of departures during the same period, by death and removals, was 70.

The most noticeable additions during the month of June were as follows:—

1. A Great Ant-eater (*Myrmecophaga jubata*) from the Argentine Republic, presented by Mr. Jeofilo Mendez, June 1st.

2. A collection of North-American Testudinata, including fine examples of *Clemmys serrata*, *Trionyx ferox*, and other interesting species, presented by the Smithsonian Institution, June 4th and June 11th.

3. A pair of White Cranes (*Grus leucogeranus*) from Northern India, purchased June 20th.

4. Two young Audouin's Gulls (*Larus audouini*) from the island of Toro, off Cape Spirone, Sardinia, presented by Lord Lilford, June 29th.

5. Living examples of the new European Lizard from Ayre Island, south-east of Minorca, which has since been described by Dr. Günther as *Zootoca lilfordi* (Ann. & Mag. Nat. Hist. 4th series, vol. xiv. p. 158), presented on the same date by Lord Lilford.

The total number of registered additions to the Society's Menagerie during the month of July was 155; of these, 52 were acquired by presentation, 26 by purchase, 65 by birth, and 12 received on deposit. The total number of departures during the same period by death and removals was 110.

The most noticeable additions during the month were:—

1. Three Giraffes, a male and two females, purchased of Mr. C. Hagenbeck, July 20th, for the sum of £1000.

2. A pair of Tigers (*Felis tigris*), presented by H.E. the Governor-General of India, July 25th.

3. A pair of Arabian Gazelles (*Gazella arabica*, Hempr. et Ehr.) from Aden, presented by Mrs. Benecke, July 25th. This species of Gazelle has never been previously received alive by the Society.

The total number of registered additions to the Society's Menagerie during the month of August was 69; of these, 37 were acquired by presentation, 19 by purchase, 5 by birth, 3 by exchange, and 5 received on deposit. The total number of departures during the same period by death and removals was 108.

The most noticeable additions during the month were:—

1. Three specimens of an apparently new Lizard of the genus *Uromastix*, obtained in the vicinity of Busreh, and presented (August 3rd) by Captain Phillips, of the S.S. 'Mesopotamia.' This species will be described by Mr. Blanford at the next scientific meeting of the Society as *Uromastix microlepis*.

2. An albino variety of the Macaque Monkey, presented by H.E. Sir Andrew Clarke, Governor of the Straits Settlements, August 11th. This curious animal was sent to Sir Andrew Clarke, R.E., K.C.M.G., by His Highness Timku Dia Udin, the Viceroy of Salangore, and is very tame and docile.

3. Two specimens of a remarkable large Skink (*Macroscincus cocteauii*) found in Ilot blanc, one of the smaller islands of the Cape-Verd group, presented by Professor Barboza du Bocage, C.M.Z.S., August 14th. See his communication on this subject, P. Z. S. 1873, p. 703.

4. A One-wattled Cassowary (*Casuarius uniappendiculatus*), obtained in New Guinea, and presented by Captain Maisby, R.N., of H.M.S. 'Basilisk,' August 25th. This is the first example of this rare Cassowary that has reached this country.

The total number of registered additions to the Society's Menagerie during the month of September was 88; of these, 48 were acquired by presentation, 12 by purchase, 5 by birth, 9 by exchange, and 14 were received on deposit. The total number of departures during the same period by death and removals was 97.

The most noticeable additions during the month were as follows:—

1. A Red-backed Squirrel Monkey (*Saimaris œrstedi*), presented by Mr. W. F. Kelly, September 5th. Mr. Kelly informs me that this animal was obtained in the Department of Solola, in Guatemala, which is a more northern locality than has yet been recorded for the species. A previous specimen was received from Costa Rica (see P. Z. S. 1873, p. 434).

2. A specimen of a peculiar species of Cat, presented (September 11th) by Mr. Spencer Shield. I was at first inclined to consider this animal the young of the Serval (*Felis serval*); but it seems certainly distinct in its small-sized and closely arranged spots, and I now think it must be the *Felis servalina* of Ogilby (P. Z. S. 1839, p. 94).

Mr. Spencer Shield writes to me as follows respecting this animal:—

"I take the liberty of addressing you in the mean time to offer you a Wild Cat which I have just brought with me from South-west Africa; and if you will accept it for your Gardens I shall have the greatest pleasure in presenting it to your collection. To my knowledge I have never seen a living specimen of the Cat which I now have in England; and these are my grounds for offering it to you. After carrying away a rare species of Stork, it was trapped by some of my servants at Kinsembo, a place on the borders of Angola and Congo, on the 15th of June last; and I have taken considerable trouble and expense to keep it alive. It is of the same size and not unlike a Serval; long slender legs and tail; the colour is a sort of olive-yellow or sand-colour, spotted here and there with small irregular spots, more particularly along its lower extremities and flanks; its ears are black and yellow (or white), like those of a Serval. It by no means resembles a Tiger Cat, and it differs much from the Serval, both of which beasts are common in Angola and Loango. It is the true 'Bush-Cat' of the Negroes, and, I believe, is rare in England."

I exhibit a drawing by Mr. Smit representing this animal, which will assist in its future recognition (see Plate LXIII.). The species was established on a flat skin, which is now in the collection of the British Museum, and is little known to naturalists.

3. An interesting collection of animals from the Seychelles Islands, presented, September 21st, by the Hon. Sir Arthur Gordon, C.M.Z.S. Amongst these are examples of the Red-crowned Pigeon (*Erythrœnas pulcherrima*), the Barkly Parrakeet (*Coracopsis barklyi*), and examples of three species of Tortoises, concerning which Sir Arthur writes to me as follows:—

"*Testudo indica*. The only island on which I know this gigantic Tortoise to exist *now* in a state of nature is Aldebra; but there is abundant evidence of their having been wild on most other islands of the Seychelles at no very remote date. At present many are kept in enclosures in the Seychelles and breed there in large numbers; of these some may have escaped into the bush, but I do not think any now exist which are not descended from those brought from Aldebra.

"*Cinixys belli*. These are only found in Mahé, and have evidently been introduced—probably accidentally.

"*Sternothærus subniger*. This Tortoise is found only in marshes in the islands of La Digue and Silhouette, and perhaps Praslin. I never heard of it at Mahé; but very possibly it might be found in the marshes up in the mountains."

Mr. Sclater gave an account of the visits which he had made during the summer to several Zoological Gardens and Museums in France and Italy, and made remarks upon the principal objects noticed therein.

In the Jardin des Plantes at Paris a new and much improved house for Reptiles and Batrachians had been erected, and had deservedly attracted much public attention. Amongst the rarities living in the Menagerie special attention was called to (1) the typical specimens of *Chœropotamus edwardsi*[*] of Grandidier, (2) a fine example of the Beisa Antelope (*Oryx beisa*) lately received from the French Vice-Consul at Aden, (3) a beautiful specimen of *Cryptoprocta ferox*, and (4) the first living example yet brought to Europe of Swinhoe's *Phasianus ellioti*, obtained in the province of Fokien by Père David.

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[*] Described Rev. et Mag. de Zool. 1867, p. 318.

At Genoa, the Museo Civico, under the directorship of the Marchese Giovanni Doria, was making great progress. A remarkable feature in this Institution was that by far the greater number of the specimens had been obtained by Italian travellers and collectors, and were therefore precisely determined as regards locality. Among special rarities were noticed:—a perfect specimen of *Lophiomys imhausii* from Keren, in the Bogos country, being the second known specimen of this rare and extraordinary mammal*; a complete skeleton of *Pontoporia blainvillii*, received from a correspondent in Buenos Ayres; and a perfect adult Cassowary from the Aroo Islands, obtained by Dr. Beccari. Of this last-named specimen, which appeared to belong to an undescribed species, Mr. Sclater promised further particulars in a subsequent communication.

Mr. G. Dawson Rowley, F.Z.S., exhibited some rare bird-skins from New Zealand, amongst which were specimens of *Apteryx haasti*, *Nestor productus*, and two living specimens of *Sceloglaux albifacies*.

Mr. Rowley made the following remarks on these birds:—

"I have the pleasure of exhibiting the following birds and other objects lately arrived from New Zealand:—

Apteryx haasti, ♂ and ♀, adult.
" " ♂ and ♀, young.
Apteryx oweni, a series, old and young.
Nestor notabilis.
Nestor superbus.
Sceloglaux albifacies, ♂ and ♀, living birds.
50 Moa-stones. These pebbles were found in one heap, and belong to the same *Dinornis*; they are very smooth.

"Concerning *Apteryx haasti* Dr. Otto Finsch says (Trans. of New-Zealand Institute, 1872, vol. v. p. 212), 'I cannot agree with Mr. Potts as to a hybridism between *A. australis* and *A. oweni*.' Again, 'I take it for a good species.' Dr. Finsch's opinion is confirmed by these specimens, and also by the fact that *Apteryx* is said to be local, one species not intermixing with another.

"Dr. Haast and Dr. Buller grant the honours of a species to this bird; these gentlemen, from the rarity of it, were forced to determine it from two skins in the Canterbury Museum, the only known examples—one found up the Okarita river, the other on the eastern shore of Lake Mapourika. Wishing to investigate more fully the question of this species, I directed the efforts of my collector to the subject; and I place before the meeting the adult male and female and the young male and female, all taken seven thousand feet above the level of the sea, thirty miles up the Okarita river, in the moun-

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* Described by A. Milne-Edwards, Nouv. Ann. d. Mus. iii. pl. 6, p. 81. There is besides this a skull in the Anatomical Museum of Berlin, upon which *Phractomys æthiopicus* of Peters (Zeitsch. f. d. g. Nat. xxix. p. 195) was established.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

[illegible]

is reason to believe that the animal is distributed (though not abundantly) throughout the upper course of the Rejang, Kapuas, Koti, Baluñgan, and, perhaps, all the larger streams of the island. Both horns and teeth are brought to Sibu by natives arriving from the above district for purposes of trade; and these articles being valued by Chinese and Malays for their supposed medicinal properties, at once command a ready sale, so that they disappear generally beyond hope of recovery.

"The Kayans call the animal 'Temadu;' and the country at the head of the Rejang, *i. e.* for the last five days of its course, would seem to be well suited to be the habitat of this bulky herbivore, being described as destitute of any settled human population, and as affording stretches of tolerably level and grassy country which affords pasture to herds of a species of wild Ox. The horns of the latter are often to be purchased at Sibu; but I have never seen a skin or a skull. The general close affinity between the faunas of Borneo and Sumatra suggests that a Bornean Rhinoceros would be found to be furnished with two horns; and, in fact, natives describe it as being so.

"It is very long since I have seen the horns of any species of Rhinoceros; but, so far as my memory serves, the large one I send is unlike that of the *R. sumatrensis*."

Mr. Bartlett exhibited a similar horn, but a larger example, which he had obtained from a friend, along with some Dyak weapons twenty years ago, and which was stated to have been received from Borneo.

Mr. Bartlett remarked that these specimens left no doubt of the existence in Borneo of a Rhinoceros which was probably allied to *R. sondaicus*, but of smaller dimensions*.

The following letters were read:—

"26 Charlotte Street,
Bedford Square, London,
October 30, 1874.

"DEAR SIR,—As I am still too unwell to attend the scientific meetings of our Society, I shall feel greatly obliged if you will state on my behalf, at the next Meeting of the Society on the 3rd of November, that I have received positive evidence of the existence of a fine undescribed Parrot on the east coast of Australia.

"This must be a magnificent bird, as will be seen from the enclosed drawing, which is said to be an exact representation of it, both as to size and colour.

"This drawing was kindly forwarded to me by Mr. Waller, and was made by his son from the specimen (unique) procured near Jimbour, which is a few miles north of Dalby, a small town on the Darling Downs in Queensland.

"Mr. Coxen writes me that the bird was in the possession of a working man, who guarded it jealously. Mr. Coxen carefully compared the bird with the drawing, and vouches for the latter being very correct. He subsequently purchased the specimen, and has placed it in the New Museum at Brisbane, of which he is the Honorary Curator.

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* *Cf.* Busk, P. Z. S. 1869, p. 409.

"I trust that before many months I shall be able to exhibit the actual specimen to this Society, as I have written and asked the favour of its being forwarded to me to enable me to figure it in my forthcoming number of the 'Supplement to the Birds of Australia.'

"For the present it will be sufficient to say that the bird is evidently allied to the genus *Aprosmictus*, of which the well-known King Parrot of Australia is the type.

"The colouring may be roughly given as follows:—Crown of the head brilliant red, separated from the bill by a narrow band of green, which green colour extends all over the face and cheeks, back of the neck, and back, interrupted, however, by certain dashes of red on the side of the neck; throat and under surface fine red; wing greenish, with a splendid large patch of bright yellow dashed with a little red occupying the shoulders and great part of the secondaries—such a mark as is seen in *Ptistes*, but of course of a different colour; the rump is blue, as is the colour of the under shoulder according to Mr. Coxen; the long tail is green.

"Compared with *Aprosmictus* the wing appears to be longer, in which respect it would approach *Ptistes*, as it would also in having its upper and under mandibles uniform in colour, viz. red; feet dark.

"The dimensions of the various parts of the drawing are—total length 15 inches, wing 7½, tail 7½.

"I wish to record my obligations to Mr. Wallace and to Mr. Coxen for having forwarded the drawing to me and enabled me to make this communication to the Society; and as they have neither laid me under restrictions in the matter, nor suggested any name, I propose assigning to this fine species the characteristic name of *Aprosmictus insignissimus*.

"I am, dear Sir,
"Yours very faithfully,
"JOHN GOULD."

"*P. L. Sclater, Esq.,*
Secretary of the
Zoological Society of London."

"33 Carlyle Square, S.W.,
July 7, 1874.

"DEAR SIR,—I return, with thanks, Prof. Peters's letter. The Bat in spirits he refers to therein, which you kindly forwarded to him for me, was one of the 'four specimens of a light reddish-brown species' mentioned in my letter from Ningpo (P. Z. S. 1872, p. 818). Prof. Peters writes, 'It is not a *Phyllorhina*, but a *Rhinolophus*, not different from *R. nippon*, Temminck, which may turn out to be the same as our *R. ferrum-equinum*. It is only a little larger, and the saddle point a little lower; but this may be an individual difference.'

"I should like also to record that the specimen of *Phyllorhina swinhoii* mentioned in the letter of mine referred to, I put into spirits and sent also to Dr. Peters. On the strength of this specimen,

showing the soft parts in more natural condition than they were in my former dried skins, Dr. Peters states, in a letter to me, that he finds the animal identical with *Phyllorhina armigera*, Hodgson, from Nepaul. *P. swinhoii* must therefore sink into a synonym under Hodgson's prior name (P. Z. S. 1870, p. 616).

"Yours very truly,
"ROBERT SWINHOE."

"*The Secretary*
of the Zoological Society."

The following papers were read:—

1. Liste des Oiseaux recueillis par M. Constantin Jelski dans la partie centrale du Pérou occidental*. Par L. TACZANOWSKI, Conservateur du Musée de Varsovie, C.M.Z.S.

[Received August 11, 1874.]

(Plates LXIV. & LXV.)

La plus grande partie des espèces nouvelles découvertes par M. Jelski a été décrite par le Dr. Cabanis dans le 'Journal für Ornithologie,' 1873, et ensuite par moi dans le 'Proceedings of the Zoological Society,' 1874. Actuellement je suis à même de présenter une liste complète des espèces que notre intrépide et infatigable voyageur a recueilli pendant les trois années de son séjour dans cet intéressant pays, grâce au concours bienveillant de MM. Sclater et Cabanis, qui ont déterminé une grande partie de ces espèces, en les comparant avec les types qui se trouvent dans les riches collections de Londres et de Berlin, ce dont je leur exprime ma haute reconnaissance.

La région explorée par M. Jelski est très-restreinte, elle est comprise entre Lima, Huanta, Monterico (Montana de Huanta, quebrada de Choymachota), Farina et Junin. Mais comme cette contrée est située dans la chaîne des Cordillères, elle comprend différents climats, depuis les régions tropicales jusqu'à celles des neiges éternelles, ce qui explique cette étonnante richesse d'espèces.

Il est à regretter que je ne puisse pas présenter ici sur cette contrée des notions géographiques, que je ne cesse de réclamer à M. Jelski et qui ne me sont pas encore parvenues; mais comme tous les exemplaires portent l'indication de la localité, je l'indique aussi sous chaque espèce, attendu que des endroits rapprochés mais différents sous le rapport climatérique renferment des faunes très-distinctes.

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* Index des espèces décrites pour le premier fois:—

1. *Anthus brevirostris*, p. 507.
2. —— *calcaratus*, p. 507.
3. *Conirostrum cyaneum*, p. 512.
4. *Buarremon mystacalis*, p. 515.
5. —— *tricolor*, p. 516.
6. *Chlorospingus chrysogaster*, p. 517.
7. *Spermophila obscura*, p. 519.
8. *Pipilo mystacalis*, p. 521.
9. *Geositta saxicolina*, p. 524.
10. *Upucerthia serrana*, p. 525.
11. *Anabazenops cabanisi*, p. 528.
12. *Ochthodiaeta signatus*, p. 532.
13. *Rhynchocyclus peruvianus*, p. 537.
14. *Myiobius superciliosus*, p. 538.
15. *Empidonax andinus*, p. 539.
16. *Leucippus pallidus*, p. 542.
17. *Hypoxanthus brevirostris*, p. 546.
18. *Gallinago andina*, p. 561.
19. *Nothoprocta branickii*, p. 563.

Tschudi a compris dans sa 'Fauna Peruana' 362 espèces, en y insérant celles qui ont été indiquées par d'autres voyageurs et qu'il n'a pas observées lui-même. M. Jelski a considérablement dépassé ce chiffre en fournissant 495 espèces. Dans ce nombre, il manque à peu près 150 espèces de Tschudi, ce nombre sera cependant un peu modifié, car quelques unes de celles de Tschudi n'ont pas été déterminées avec précision. Il restera toujours au moins une centaine d'espèces au delà du chiffre de la faune ornithologique de la contrée explorée par notre voyageur.

La liste des oiseaux du Pérou oriental, publiée par MM. Sclater et Salvin*, contient les espèces recueillies par les trois voyageurs, Bartlett, Bates, et Hauxwell, sur une surface beaucoup plus vaste que celle de M. Jelski. Elle contient 473 espèces, parmi lesquelles il n'y en a que 89 trouvées aussi par M. Jelski au Pérou occidental; le plus grand nombre cependant de ces espèces vient de Monterico, situé sur le versant oriental des Cordillères. Pour recueillir cette collection, M. Jelski a employé un temps à peu près égal à celui de M. Bartlett, c'est à dire depuis la fin de 1870 jusqu'à 1873 inclusivement.

En comparant les deux listes on voit dans plusieurs familles une grande différence, remarquable particulièrement dans les Tyrannides et les Fringillides. Au Pérou oriental, il n'y a que 9 espèces de ces derniers, tandis qu'il y en a 30 dans l'occidental; au lieu de 40 Tyrannides du Pérou oriental il y en a 71 au Pérou occidental; cette différence est occasionnée par la présence d'un nombre considérable de Tænioptérides (22 espèces), qui habitent les hauts plateaux arides, tandis que les autres Tyrans sont également nombreux dans les vallées chaudes et boisées.

Les Dendrocolaptides sont aussi beaucoup plus nombreux: il y en a 28 espèces dans le Pérou oriental et 44 dans l'occidental. La raison est la même, car dans cette dernière contrée il y a un nombre considérable de Geosittes, de *Cillurus* et autres habitants des montagnes.

Il y a aussi plus de Tanagrides: 34 au Pérou oriental et 53 dans l'occidental. Grande différence dans les Cœrebides: 9 dans le Pérou oriental et 17 au Pérou occidental. Les Trochilides sont aussi plus nombreux: 33 au Pérou oriental, 40 dans l'occidental, etc. Le Pérou occidental présente aussi une grande supériorité à l'égard des Echassiers et des Palmipèdes.

D'un autre coté il y a des familles moins richement représentées dans ces parages, telles que les Trogonides, Galbulides, Cuculides, Psittacides, Ictérides; ces derniers sont représentés par 6 espèces dans la collection de M. Jelski, tandis qu'il y en a 18 dans la liste du Pérou oriental.

Castelnau, dans son mémoire présenté à la séance du 6 Mars 1848, de l'Académie des Sciences, a communiqué l'observation suivante: "Sur 3750 individus appartenant à la classe des oiseaux, dont nous avons constaté le sexe par des recherches anatomiques pendant le cours de mon expédition dans l'Amérique du Sud, il ne se trouvent que 287 appartenant au sexe féminin, ou environ $\frac{1}{13}$. Il semble donc que la chaleur est favorable à la mutabilité du type et aux changements des formes, et que, d'autre part, la nature ne voulant pas que les individus subissent cette loi de progression en ait limité la multiplication par la grande infériorité numérique du sexe chargé de la gestation, etc." Plus loin il dit que "lorsque nous possédions le mâle d'une espèce, nous faisions tous nos efforts pour nous procurer l'autre sexe."

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* P. Z. S. 1873, p. 252.

La collection de M. Jelski combat complétement cette observation. Presque tous les exemplaires y ont le sexe constaté, et quoique le sexe masculin y prédomine, sa proportion ne dépasse pas celle qu'on trouve toujours dans des collections ornithologiques formées dans d'autres contrées. Même en Europe, où l'on connaît bien les mœurs des oiseaux, et où on se sert de différents moyens pour prendre les femelles, on recueille toujours beaucoup plus de mâles, mais leur supériorité numérique n'y sera pas moindre que dans la collection de M. Jelski. La supposition de Castelnau n'est pas juste; quiconque connaît bien les habitudes des oiseaux en liberté, comprend parfaitement que la nidification deviendrait impossible s'il y avait dans la contrée tant de mâles célibataires, qui parviendraient toujours à découvrir les paires afin de les troubler. Il faut donc chercher ailleurs les causes pour lesquelles, dans les contrées tropicales, les espèces sont moins riches en individus. Une de ces causes sera certainement le nombre plus restreint d'œufs qu'on trouve dans les pontes des oiseaux habitant cette zone.

Family Turdidæ.

1. Turdus leucomelas, Vieill.; Scl. et Salv. P. Z. S. 1873, p. 256.

Turdus ignobilis, Scl.

Une paire d'Amable-Maria.

2. Turdus crotopezus, Licht.; Bp. Consp. Av. i. p. 272.

Une femelle d'Amable-Maria.

3. Turdus swainsoni, Cab.; Tsch. Fn. Peru. Orn. p. 187; Scl. et Salv. P. Z. S. 1873, p. 255.

Plusieurs exemplaires de Monterico.

4. Turdus nigriceps. (Plate LXIV.)

"*Turdus nigriceps*, Jelski," Cab. Journ. f. Orn. 1874, p. 97.

Cette espèce nouvelle, fondée sur un mâle unique de Soriano, me semble devoir être rapprochée au *Turdus reevei* de Lawrence, Ann. L. N. Y. ix. p. 234.

5. Turdus gigantodes, Cab. Journ. f. Orn. 1873, p. 315.

Plusieurs exemplaires de Maraynioc et de Ninabamba.

6. Turdus chiguanco, Lafr. et D'Orb.

Nombreux exemplaires de Chilpes, de Huanta, et de Maraynioc.

Il est probable que Tschudi l'a compris dans sa '*Fauna Peruviana*' sous le nom de *T. fuscater*, Lafr.

7. **Turdus serranus**, Tsch. Fn. Peru. Orn. p. 186; Scl. et Salv. P. Z. S. 1870, p. 783.

Turdus atrosericeus, Lafr.

Une paire de Chilpes et un mâle de Ropaybamba.

8. **Catharus fuscater**, Lafr.

Malacocichla fuscater, Gr. H.-l. B. Brit. Mus. 1869, i. p. 259.

Une exemplaire de Chilpes.

9. **Mimus longicaudatus**, Tsch. Fn. Peru. Orn. p. 193, t. 15. f. 2.

Une paire des environs de Lima.

Family CINCLIDÆ.

Cinclus leucocephalus, Tsch. Fn. Peru. p. 180, t. 15. f. 1.

Un mâle tué entre Cucas et Palcamayo. M. Jelski dit que cet oiseau n'est pas rare dans la contrée mais difficile à chasser à cause de l'extrême rapidité du ruisseau, qui emporte les oiseaux tués avant que le chasseur puisse les atteindre.

Family TROGLODYTIDÆ.

1. **Thryothorus cantator**, Tacz. P. Z. S. 1874, p. 130.

Un oiseau adulte sans indication de sexe et un jeune mâle d'Amable-Maria.

Un troisième exemplaire sans indication de sexe tué en 1873 à Pumamarca paraît être un mâle adulte de cette espèce, décrite probablement d'après une femelle et un jeune oiseau. Cet exemplaire a les côtés du visage noirs, comme dans le *T. coraya*, mais sans stries blanches, il a seulement une ligne de cette couleur, très-mince, qui commence au-dessus de l'angle postérieur de l'œil et parcourt jusqu'à l'extrémité de la tête. Le dessus de la tête, la nuque et les côtés du cou sont d'une couleur grise-olivâtre foncée. Les subcaudales sont rayées transversalement comme dans le *T. coraya*. La gorge est blanche pure, le reste du dessous est d'une couleur grise teinte légèrement de brunâtre sur les côtés. Le dos, les ailes et la queue sont comme celles des exemplaires qui ont servi à la description citée.

Cet individu ressemble encore plus au *T. coraya* que les précédents et en diffère principalement par le manque de stries blanches sur les côtés du visage, par la nuance différente du dessus de la tête et du dessous du corps, par les stries transversales rousses au lieu de grises des rectrices, et par le bec considérablement moins long.

2. **Henicorhina leucophrys**, (Tsch.) Fn. Per. Orn. p. 185.

Femelle unique de Sillapeta.

3. **Cistothorus humivagans**, Tacz. P. Z. S. 1874, p. 130.

Un mâle adulte et un jeune oiseau de Maraynioc; un mâle de Pumamarca.

4. **TROGLODYTES SOLSTITIALIS**, Scl.

Plusieurs exemplaires adultes et jeunes de Maraynioc et de Pumamarca.

Deux œufs de cet oiseau trouvés le 15 Mars, 1873, à Pumamarca, diffèrent beaucoup de ceux du *T. audax*, Tsch. Ils sont blancs purs variés de taches rouge-rouille, assez grosses et assez nombreuses près du gros bout, plus petites et plus rares au petit, mêlées à d'autres roses violacées pales, beaucoup moins nombreuses que les premières. Ces œufs ressemblent beaucoup à ceux du *Parus major*.

Dimensions: 18·4—13·5, 18·5—13·3 millim.

5. **TROGLODYTES AUDAX**, Tsch. Fn. Peru. Orn. p. 185

Des oiseaux adultes et jeunes, des œufs et des nids de Huanta, de Monterico et de Maraynioc.

Le nid de ce Troglodyte est d'une construction très simple; il est composé d'herbes et de graminées sèches et affaiblies par l'action du temps, mélangées avec de la laine, des plumes et d'autres matières semblables. Il est très bas et peu régulier, à texture lâche, découvert par dessus. L'intérieur, qui est peu profond, est garni plus ou moins abondamment de plumes, de crin de cheval et de gros cheveux de bétail. Hauteur 4·5 cent., largeur 10–11; diamètre de l'intérieur 5·5; profondeur 2·5. Les œufs présentent beaucoup de variétés en coloration. Le fond est d'une couleur rose pâle, varié de nombreuses petites taches et de petits traits rouges, mélangées avec d'autres pâles d'un rose-violacé. Sur les uns les taches sont disposées également sur toute la surface et ressemblent aux œufs de certaines variétés du *Phylloscopus trochilus*. Sur d'autres les taches sont plus petites, réduites en points nombreux sur toute la surface et formant une couronne plus ou moins dense autour du gros bout, imitant les œufs du *Locustella rayi* dans leurs différentes variétés. Sur d'autres les taches sont plus grandes, moins nombreuses sur le fond plus blanc, et ces œufs ressemblent à ceux des Mésanges. Il y a aussi des différences considérables dans la forme, les uns sont courts et ventrus tandis que les autres sont beaucoup plus allongés. Dans chaque ponte les œufs sont plus ou moins uniformes. Dimensions des œufs de différentes pontes: 17—13, 17·5—14, 18·2—13·3, 18·2—12·8, 19—13 millim.

Nombre des œufs dans une ponte 3–4.

6. **CYPHORHINUS THORACICUS**, Tsch. Fn. Peru. Orn. p. 184.

Mâle unique de Monterico.

7. **PRESBYS PERUANUS**, Cab. Journ. f. Orn. 1873, p. 317.

Un mâle, une femelle, et un jeune de Maraynioc.

Un œuf trouvé le 26 Août, 1871, à Maraynioc, ressemble à ceux du *Troglodytes*. Il est ové, allongé, à extrémités mousses, blanc varié de rares petites taches et de points rouges, plus nombreux au gros bout. La surface est sans aucun lustre. Dimensions, 21·3—14·18 millim.

4. [illegible], Scl. et Salv. P. Z. S. 1873, p. [illegible].

Femelle unique d'Amable-Maria.

Family ANTHIDAE.

5. Anthus chii, Vieill. Nouv. Dict. Sc. N. xxvi. p. 490; Tsch. Fn. Per. (Orn.) p. [illegible].

Plusieurs individus des environs de Lima, tués dans les premiers jours de Janvier 1871.

Ongle postérieur plus long que le doigt, peu courbé; doigt postérieur avec l'ongle égalant la hauteur du tarse.

Première rémige un peu plus courte que la seconde; les 2e, 3e et 4e, les plus longues et égales entre elles; la cinquième plus courte que la première.

Première rectrice fauve-blanchâtre, à liseré foncé au bord interne, dépassant la moitié de sa longueur, seconde fauve-blanchâtre sale dans sa moitié externe et foncée dans toute la longueur de l'interne.

Subalaires blanchâtres, le bord interne des rémiges gris-clair.

Rémiges primaires finement bordées de vert jaunâtre.

Tout le dessous fauve-pâle, presque uniforme partout. Stries sur la poitrine triangulaires, brunes, assez nombreuses; côtés du ventre distinctement striés.

Parties supérieures d'un fauve grisâtre tacheté de brun, la nuque et les grandes taches sur les côtés du dos plus claires blanchâtres.

Long. tot. 14 cent., aile pliée 67 millim., pouce 10 millim., ongle postérieur 12 millim.

M. Jelski a observé que dans les environs de Lima cet oiseau couve principalement les œufs du *Molothrus sericeus*?* Dans les nids qu'il trouvait il y avait toujours les œufs de ce dernier depuis 1–4, et jamais d'œufs du Pipit, et c'est seulement dans un seul qu'il a trouvé un œuf de l'*Anthus* avec 3 du *Molothrus*.

Cet œuf est blanc avec une couronne brune assez large et dense près du gros bout, qui est parsemé d'assez nombreuses taches de même couleur; à l'extérieur de la couronne il y a aussi des petites taches et des points bruns, de plus en plus rares en approchant du sommet, qui est presque pur. La forme de cet œuf est différente de celle de l'œuf du *Molothrus*, elle est comme celle des autres *Anthus*; la coque est delicate, et le lustre est beaucoup plus faible. Il présente une grande différence en grandeur: il est 19 mm. long sur 14·5 de largeur, tandis que les œufs du *Molothrus* du même nid ont les dimensions suivantes: 24—18·2, 22·5—18·4, 22·3—18 millim.

La coloration des œufs du *Molothrus* est bien différente: le fond est blanc légèrement bleuâtre, parsemé de taches et de points bruns, petits, rares et également distribués sur toute la surface. Un œuf (le plus grand) est un peu différent: la nuance bleu est moins pure et moins prononcée, les taches sont plus nombreuses, plus petites et transformées en grande partie en petits traits; leur nuance n'est pas la même. Il est probable que ce dernier a été déposé par une autre femelle.

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* Je ne peux pas indiquer au juste l'espèce, car M. Jelski a fourni seulement des jeunes oiseaux.

Le nid est construit de nombreuses grosses herbes, parmi lesquelles il y a quelques unes à grosses feuilles employées en état frais; les matériaux deviennent de plus en plus fins en approchant du milieu, qui est nettement arrangé de brins delicats et fortifié de quelques crins de cheval; l'intérieur est irrégulier. Dimensions: Hauteur 5 cent., largeur 13, diamètre de l'intérieur 5, profondeur 4.

2. ANTHUS BREVIROSTRIS, sp. nov.

Supra fulvo brunneoque varius; pectore fulvo, brunneo maculato; gula abdomineque albis; subcaudalibus fulvo-albidis; subalaribus albis; primariis albido limbatis; duabus rectricibus externis albis, prima in pogonio interno a basi ad mediam longitudinem fusco limbata, secundæ limbus fuscus ad apicem fere productus. Rostri nigricantis mandibula inferior pallida; pedes carnei; ungues flavido-albicantes; iris fusco brunnea.

Trois exemplaires tués à Junin à la fin de Juin, 1872.

Doigt postérieur avec l'ongle un peu plus court que le tarse, l'ongle à faible courbure presque aussi long que le pouce.

Première remige un peu plus courte que la seconde, qui est la plus longue, et presque égale à la troisième et quatrième.

Première rectrice blanche à bordure foncée dans la moitié basale du bord interne; la bordure foncée dans la seconde est large et s'étend jusqu'au près de l'extrémité.

Subalaires blanches, ainsi que le bord interne des remiges; première remige bordée de blanc, les autres primaires de fauve très pâle.

Gorge et ventre blancs, poitrine fauve; flammèches sur la poitrine grosses, triangulaires, brunes. Côtés du ventre fauves, striés de brun.

Parties supérieures fauves roussâtres, tachetées de brun.

Longueur tot. 16 centim., aile pliée 82 millim., pouce 8 millim., ongle postérieur 8 millim.

Cette espèce paraît être proche de l'*A. furcatus*, Lafr. et D'Orb.

3. ANTHUS CALCARATUS, sp. nov.

Fulvo-rufescens nigro maculatus, pectore lateribusque vivide fulvo-rufescentibus, maculis nigris latis aspersis; abdomine medio, subcaudalibus subalaribusque albido-fulvescentibus; primariis albido limbatis; rectrice externa tota alba, interne late fusco limbata. Rostri nigricantis mandibula basi pallida; pedes sordide carnei; ungues corneo-brunnei; iris fusco-brunnea.

Une paire receuillie dans les marais de Junin.

Doigt postérieur avec l'ongle plus long que le tarse; ongle plus long que le doigt, très peu courbé.

Première remige considérablement plus courte que la seconde; les seconde, troisième, quatrième et cinquième les plus longues, presque égales entre elles.

Première rectrice blanche en entier, à tige seulement foncée à la [illegible] [illegible]; la seconde largement bordée de foncé dans presque toute la longueur de sa barbe interne.

Sous-alaires [illegible]; bord interne des remiges blanc; remiges primaires bordées de roussâtre.

Gorge, milieu du ventre et les subcaudales fauves-blanchâtres; poitrine, le devant et les côtés du ventre roussâtres: stries triangulaires noires.

Parties supérieures d'une couleur roussâtre vive, tachetées de noir.

Longueur tot. [illegible] centim., aile pliée 75 millim., pouce 10 millim., ongle postérieur 13 millim.

4. Anthus bogotensis, Scl. P.Z.S. 1855, p. 109, t. 101.

Anthus rufescens, Lafr. et D'Orb. Syn. Av. 27.

Pediocorys bogotensis, Gr. H.-L. B. Brit. Mus. 1869, i. p. 250.

Trois exemplaires de Maraynioc.

Doigt postérieur avec l'ongle considérablement plus court que le tarse; l'ongle un peu plus long que le pouce, à faible courbure.

Première remige plus courte que la seconde; les seconde, troisième et la quatrième les plus longues et égales, la cinquième un peu plus longue que la première.

Première rectrice fauve dans sa moitié externe et foncée dans l'interne de manière que la barbe interne est toute foncée dans sa moitié basale; la seconde foncée en entier est finement lisérée de blanchâtre à l'extrémité.

Sous-alaires rousses ainsi que le bord interne des remiges; remiges primaires bordées extérieurement de roussâtre.

Tout le dessous est fauve-roussâtre, plus intense sur la poitrine. Très peu de flammèches foncées sur la poitrine, et presque point sur les côtés du ventre.

Parties supérieures rousses tachetées de brun noirâtre.

Longueur tot. 16 centim., aile pliée 79 millim., pouce 10 millim., ongle postérieur 11 millim.

Family Mniotiltidæ.

1. Dendrœca canadensis (L.); Baird, Birds N. Am. p. 271.

Un mâle et deux femelles de Monterico et d'Amable-Maria.

2. Dendrœca cœrulea (Wils.); Baird, Birds N. Am. p. 280.

Plusieurs exemplaires adultes et jeunes de Monterico et de Pumamarca.

3. Dendrœca blackburniæ (Gm.); Baird, Birds N. Am. p. 274.

Deux mâles d'Anquimarca.

4. Myioborus verticalis, (Lafr. et D'Orb.) D'Orb. Voy. p. 330, t. 35. f. 1; Tsch. Fn. Peru. Orn. p. 191.

Des exemplaires de Monterico, de la Montana de Vitoc et de Ropaybamba.

5. **Myioborus melanocephalus**, (Tsch.) Fn. Peru. Orn. p. 182, t. 12. f. 1.

Une paire de Chilpes et une de Pumamarca.

6. **Basileuterus coronatus**, (Tsch.) Fn. Peru. Orn. p. 193, t. 16.

Trois exemplaires de Paltaypampa et de Anquimarca.

7. **Basileuterus diachlorus**, Cab. Journ. f. Orn. 1873, p. 316.

Trois exemplaires de Monterico et d'Amable-Maria.

8. **Basileuterus uropygialis**, Scl. P. Z. S. 1861, xxix. 128; Scl. et Salv. P. Z. S. 1873, p. 257.

Plusieurs exemplaires de Monterico et d'Amable-Maria.

9. **Myiothlypis luteoviridis**, Bp. Consp. i. p. 311, sp. 2.

Des exemplaires de Maraynioc, de Ninabamba, de Sillapeta, et Pumamarca.

Family Vireonidæ.

1. **Vireosylvia josephæ**, (Scl.) P. Z. S. 1859, p. 139, t. 154; Id. Cat. Am. B. p. 42.

Un mâle de Paltaypampa.

2. **Vireosylvia flavoviridis**, Cass. Proc. Ac. Philad. v. p. 152; Scl. Cat. Am. B. p. 44.

Un mâle de Monterico.

3. **Vireolanius chlorogaster**, Bp. Compt. Rend. xxxviii. p. 380.

Vireolanius dubusii, Verr. MS.

Un mâle de Monterico. Les yeux de cet oiseau sont verts clairs.

4. **Hylophilus flaviventris**, Cab. Journ. f. Orn. 1873, p. 64.

Un exemplaire de Monterico.

5. **Hylophilus ferrugineifrons**, Scl.

Un exemplaire d'Amable-Maria.

6. **Cyclorhis guianensis** (Gm.); Bp. Consp. p. 321 (pt.); Scl. et Salv. P. Z. S. 1873, p. 257.

Cyclorhis poliocephala, Tsch. Fn. Peru. Orn. p. 169.

Un mâle de Paltaypampa.

Family Ptilogonydidæ.

Ptilogonys leucotis, Tsch. Fn. Peru. Orn. 139, t. vii. f. 1.

Unique exemplaire de Paltaypampa.

Family Hirundinidæ.

1. **Hirundo erythrogastra**, Bodd.; Scl. et Salv. Nomencl. Av. Neotr. p. 14.

Hirundo horreorum, Vieill. Ois. A. S. t. 30.
—— *americana*, Wils. A. O. t. 38. f. 1 et 2.

Plusieurs exemplaires des deux sexes de Lima.

2. **Hirundo andicola** (Lafr.); Scl. et Salv. Nom. Av. Neotr. p. 14; Tsch. Fn. Peru. p. 132.

Un exemplaire pris entre Cucas et Palcamayo.

3. **Atticora cyanoleuca** (Vieill.); Scl. et Salv. Nom. Av. Neotr. p. 14; Scl. et Salv. P. Z. S. 1873, p. 25.

Un mâle adulte de Lima, un jeune oiseau d'Amable-Maria.

4. **Atticora cinerea** (Gm.); Scl. P. Z. S. 1869, p. 599; Scl. et Salv. Nom. Av. Neotr. p. 14.

Un mâle adulte et un jeune oiseau entre Cucas et Palcamayo.

5. **Stelgidopteryx ruficollis** (Vieill.); Scl. et Salv. Nom. Av. Neotr. p. 15, et P. Z. S. 1873, p. 259.

Un mâle adulte et un jeune oiseau de Monterico.

Family Cœrebidæ.

1. **Cœreba nitida**, Hartl. Rev. Zool. 1847, p, 84; Scl. et Salv. P. Z. S. 1873, p. 260.

Mâle unique de Paltaypampa.

2. **Dacnis cayana** (L.); D'Orb. Syn. Av. p. 20; Tsch. Fn. Peru. Orn. p. 37; Scl. et Salv. P. Z. S. 1873, p. 259.

Plusieurs exemplaires de Monterico.

3. **Dacnis pulcherrima**, Scl. Rev. et Mag. Zool. 1853, p. 480; *id.* Cat. Am. B. t. 8.

Mâle unique de Paltaypampa.

4. **Dacnis modesta**, Cab. Journ. f. Orn. 1873, p. 64.

Femelle unique de Monterico. Selon l'indication de M. Jelski l'iris de cet oiseau est jaune.

5. **Dacnis xanthophthalma**, Tacz. P. Z. S. 1874, p. 131.

Une femelle de Maraynioc.

6. **Dacnidea albiventris**, Tacz. P. Z. S. 1874, p. 131, t. 19. f. 2.

Un paire de Maraynioc.

7. **Xenodacnis parina**, Cab. Journ. f. Orn. 1873, p. 311.

Plusieurs exemplaires des deux sexes de Monterico.

8. **Diglossa personata**, Fras. P. Z. S. 1840, p. 23; Tsch. Fn. Peru. Orn. p. 237.

Plusieurs exemplaires de Maraynioc.

9. **Diglossa pectoralis**, Cab. Journ. f. Orn. 1873, p. 318.

Plusieurs exemplaires de Maraynioc.

10. **Diglossa brunneiventris**, Desm. Iconogr. Orn. pl. 43.

Nombreux exemplaires de Maraynioc.

11. **Diglossa sittoides** (Lafr.); D'Orb. Voy. Am. m. t. 58. f. 2; Gr. Gen. B. i. p. 137.

Trois exemplaires d'Anquimarca et de Pumamarca.

12. **Diglossopsis cærulescens**, Scl. Ann. Mag. N. H. 1856, xvii. p. 467.

Un exemplaire de Ninabamba.

13. **Conirostrum cinereum**, Lafr. et D'Orb. Voy. Am. Mér. p. 174, t. 49. f. 1; Tsch. Fn. Peru. Orn. p. 236; Cab. Journ. f. Orn. 1873, p. 64.

Plusieurs exemplaires des environs de Lima.

14. **Conirostrum ferrugineiventre**, Scl. P. Z. S. 1855, p. 74, t. 85.

Un mâle.

15. **Conirostrum atrocyaneum**, Lafr. Rev. Zool. 1848, p. 9.

Un mâle adulte de Chilpes, un autre mâle et un jeune de Pumamarca.

Les deux mâles adultes ont le dessus de la tête, le pli de l'aile ainsi que ses petites couvertures, le bas du dos et le croupion, comme le dit Lafresnaye, d'un beau bleu-violet foncé; le reste est noir intense excepté les subcaudales, qui sont aussi bleues, mais d'une teinte plus foncée que les parties indiquées plus haut. L'exemplaire tué le 28 Novembre est beaucoup plus brillant que celui du 17 Août. Le bleu s'etend aussi sur le devant du dos et au cou, perdant graduellement d'intensité en approchant de la calotte; le ventre est aussi légèrement teint de bleu foncé; les rectrices sont aussi bordées de même couleur.

Le jeune exemplaire dont le sexe n'est pas indiqué a le dessus du corps vert-olivâtre, le dessous jaune-olivâtre sale; les côtés du visage cendrés, la calotte bleue indigo, mais parmi les plumes de cette dernière il y a encore quelques unes de la couleur égale à celle du dos, ce qui démontre que l'oiseau en premier plumage a eu le dessus de la tête de même nuance que le dos et qu'il changeait en bleu.

Il est probable que c'est une espèce distincte du *C. albifrons*, Lafr., avec lequelle on l'a confondu.

16. CONIROSTRUM CYANEUM, sp. nov.

Supra ardesiaco-cyaneum, subtus totum a pectore rufum; pileo nigro, anterioribus capitis collique cinereis, cyaneo vix indutis; superciliis latis cyaneis; remigibus rectricibusque fuscis cyaneo marginatis. Rostrum nigrum, pedes fuscescentes, iris fusco-brunnea. Long. tota [illegible], *alae* 64, *caudae* 63, *tarsi* 18, *rostri a commissura* 12 *millim.*

Un exemplaire sans indication de sexe tué à Sillapata le 22 Février 1871.

Cette espèce est voisine du *C. sitticolor*, Lafr., et s'en distingue principalement par la bande sourcilière bleue, qui prend naissance devant l'œil et s'élargissant graduellement en arrière se confond avec la couleur des côtés du cou de même nuance. Le sommet de la tête est seulement noir, tandis que les côtés du visage et la gorge sont d'une couleur cendrée foncée, légèrement teinte de bleuâtre. Tout le dessous est roux, plus foncé sur les côtés et plus clair au milieu. Le dos est bleu, plus intense au croupion et sur le devant de l'aile. Les rémiges et les rectrices sont noirâtres à bordures bleues, excepté celles des primaires qui sont blanchâtres.

17. CERTHIOLA PERUVIANA, Cab. Journ. f. Orn. 1865, p. 413.

Un oiseau adulte et un jeune de Paltaypampa.

Un nid trouvé le 13 Mai 1872 sur un jeune oranger, aux environs d'Amable-Maria, est construit de larges feuilles de graminées, et de longues tiges ramifiées d'une mousse, mélangées avec des duvets végétaux. Il a la forme d'une boule couverte par dessus, à peu près comme ceux des *Phylloscopi* ou du Troglodyte d'Europe, mais il est légèrement comprimé latéralement. L'entrée est parfaitement ronde, placée près du sommet d'une paroi un peu prolongée en avant, de manière qu'elle est un peu inclinée et parfaitement abritée par dessus. L'intérieur qui est profond, est garni de pareils matériaux, mais sans duvet, et au lieu de la mousse citée plus haut qu'on voit en grande nombre sur la surface, il y a beaucoup de fines tiges de graminées, avec lesquelles l'entrée est entourée d'une manière solide. Hauteur 13 centim., largeur 10, diamètre de l'entrée 3·5.

Les deux œufs que contenait ce nid ressemblent à une certaine variété des œufs du *Phylloscopus trochilus* : ils ont le fond blanc-rougeâtre marqué de nombreuses petites taches et de traits irréguliers d'un roux-rouille peu foncé, mélangées avec d'autres plus pâles ; ces taches sont disposées sur toute la surface, mais elles sont plus denses au gros bout. Ce mode de coloration ressemble aussi à celui des Pipits et des Printanières. La surface est sans aucun lustre. Dimensions : 17·5—13, 18·2—12·7 millim.

Family TANAGRIDÆ.

1. RHAMPHOCŒLUS ATROSERICEUS (Lafr. et D'Orb.); Tsch. Fn. Peru. Orn. p. 206.

Une paire (♂ et ♀) de Monterico.

Le nid fourni de la même localité est construit d'une couche pas trop grosse mais compacte de grandes feuilles, mélangée avec un peu d'herbes fortes et de filaments végétaux; garni dans son intérieur d'une manière assez soignée de cirrhes de plantes, un peu plus gros que le crin de cheval. La construction est simple mais solide; il paraît que les feuilles ont été employées en état humide. Hauteur 7 centim., largeur 11, diamètre de l'intérieur 7, profondeur 4·5.

Les deux œufs que contenait ce nid ressemblent à ceux du *R. jacapa,* mais ils sont un peu plus petits, à couleur bleue du fond plus intense et à taches noires plus nombreuses, disséminées irrégulièrement sur toute la surface. Dimensions: 22—16, 22·3—15·8 millim.

2. **LANIO VERSICOLOR** (Lafr. et D'Orb.); Scl. et Salv. P. Z. S. 1873, p. 262.

Plusieurs individus des deux sexes de Monterico.

3. **TANAGRA CŒLESTIS,** Spix; Scl. et Salv. P. Z. S. 1873, p. 261.

Une paire (♂ et ♀) de Paltaypampa.

4. **TANAGRA MELANOPTERA,** Hartl.

Tanagra olivascens, Tsch. Fn. Peru. Orn. p. 204.

Un mâle de Monterico.

5. **TANAGRA DARWINI,** Bp.

Tanagra frugilegus, Tsch. Fn. Peru. Orn. p. 204, t. 17. f. 1.

Nombreux exemplaires de Lima, Huanta, Maraynioc, et Pumamarca.

6. **TANAGRA CYANOCEPHALA,** Lafr. et D'Orb.; Tsch. Fn. Peru. Orn. p. 205.

7. **BUTHRAUPIS CUCULLATA** (Jard. et Selb.).

Deux paires de Maraynioc et de Higos.

8. **TACHYPHONUS RUFIVENTRIS** (Spix); Scl. et. Salv. P. Z. S. 1866, p. 180, et 1873, p. 262.

Plusieurs exemplaires des deux sexes de Monterico.

9. **CREURGOPS VERTICALIS,** Scl. P. Z. S. 1858, p. 73.

Un mâle de Ropaybamba, tué le 12 Avril 1873.

10. **COMPSOCOMA SUMPTUOSA** (Less.).

Tachyphonus flavinucha, Tsch. Fn. Peru. Orn. p. 208.

Plusieurs exemplaires de Paltaybampa et d'Anquimarca.

11. **TRICHOTHRAUPIS QUADRICOLOR** (Vieill.).

Plusieurs exemplaires d'Amable-Maria et de Ropaybamba.

12. **PHŒNICOTHRAUPIS RUBICA** (Vieill.); Scl. et Salv. P. Z. S. 1873, p. 262.

Deux mâles de Monterico.

13. Pyranga azaræ (Lafr. et D'Orb.); Tsch. Fn. Peru. Orn. p. 206.

Mâle unique de Junin.

14. Pyranga rubra (L.)?

Un jeune mâle prenant quelques plumes rouges de Monterico.

15. Pœcilothraupis ignicrissa, Cab. Journ. f. Orn. 1873, p. 317.

Deux paires de Maraynioc.

16. Pœcilothraupis lacrymosa (Dubus).

Plusieurs individus de Maraynioc et de Higos.

17. Iridornis analis, (Tsch.) Fn. Peru. Orn. p. 205, t. 18. f. 1.

Femelle unique de Paltaypampa.

18. Iridornis jelskii, Cab. Journ. f. Orn. 1873, p. 316.

Deux paires de Maraynioc.

19. Iridornis reinhardti, Scl. Ibis, 1865, i. p. 495, t. 11.

Deux mâles de Pumamarca.

20. Calliste yeni (Lafr. et D'Orb.); Tsch. Fn. Peru. Orn. p. 201; Scl. et Salv. P. Z. S. 1873, p. 261.

Deux mâles de Monterico.

21. Calliste schranki (Spix); Tsch. Fn. Peru. Orn. p. 201; Scl. et Salv. P. Z. S. 1873, p. 261.

Nombreux exemplaires de Monterico et d'Amable-Maria.

22. Calliste xanthogastra (Bp.); Scl. et Salv. P. Z. S. 1866, p. 180, et 1873, p. 261.

Un mâle de Paltaypampa.

23. Calliste pulchra, (Tsch.) Fn. Peru. Orn. p. 260, t. 18. f. 2.

Un mâle d'Amable-Maria.

24. Calliste argentea, (Tsch.) Fn. Peru. Orn. p. 199, t. 14. f. 2.

Un mâle de Paltaypampa.

25. Calliste gyroloides (Lafr.).

Callospiza gyrola, Tsch. Fn. Peru. Orn. p. 202.

Une femelle de Monterico.

26. Calliste ruficervix (Prev.); Scl. Callist. t. 32.

Deux mâles de Paltaypampa et de Ropaybamba.

27. Calliste nigriviridis (Lafr.).

Un mâle d'Anquimarca.

28. **Calliste cyaneicollis** (Lafr. et D'Orb.); Tsch. Fn. Peru. Orn. p. 202.

Une paire de Monterico et un mâle de Paltaypampa.

29. **Calliste parzudakii** (Lafr.); Scl. Callist. t. 41.

Deux mâles de Chilpes et d'Anquimarca.

30. **Calliste cyanotis**, Sclater.

Un mâle de Paltaypampa.

31. **Calliste xanthocephala**, (Tsch.) Fn. Peru. Orn. p. 200, t. 17. f. 2.

Un mâle de Ropaybamba.

32. **Calliste atrocærulea**, (Tsch.) Fn. Peru. Orn. p. 199, t. 13. f. 2.

Une paire (♂ et ♀) de Pumamarca, un mâle de Paltaypampa.

33. **Nemosia ornata**, Scl.

Un mâle d'Arancocha, une paire (♂ et ♀) d'Anquimarca.

34. **Chlorochrysa calliparæa**, (Tsch.) Fn. Peru. p. 202.

Deux mâles d'Amable-Maria et de Pumamarca.

35. **Buarremon brunneinuchus** (Lafr.)

Arremon frontalis, Tsch. Fn. Peru. Orn. p. 212, t. 19. f. 2.
Un mâle de Ropaybamba.

36. **Buarremon torquatus** (Lafr. et D'Orb.).

Un mâle de Maraynioc.

37. **Buarremon mystacalis**, sp. nov.

Ardesiacus, subtus cinerascens; abdomine medio gulaque albicantibus, vertice rufo-cinnamomeo; fronte media, capitis lateribus, vittaque submystacali nigris; macula laterali frontis mystacibusque albis; alis caudaque nigricantibus: rostrum nigricans; pedes pallide brunnei; iris rufa. Long. tota 165, *alæ* 79, *caudæ* 85, *tarsi* 28, *rostri a commissura* 18 *millim.*

Plusieurs individus de Maraynioc, de Higos et de Sillapeta.

Une large bande de cannelle vive couvre tout le sommet de la tête et s'étend jusqu'à la nuque en y prenant le ton plus clair et plus vif; le milieu du front et les côtés de la tête sont noirs encadrant largement l'œil; une tache blanche occupe les côtés du front et une large moustache de même couleur s'étend depuis le bec tout le long des côtés de la tête; cette dernière est séparée de la couleur gris-blanchâtre de la gorge par un trait noir. Le dos est ardoise-foncé uniforme; le dessous est gris-cendré plus foncé sur les côtés et plus ou moins blanchâtre au milieu du ventre. Les ailes et la queue sont noirâtres; les subalaires cendrées. Dans les individus tués aux mois de Juin et de Juillet la couleur cannelle de l'occiput est plus pâle et prend le ton fauve en arrière; la gorge est blanche sans trace de nuance cendrée.

Cette espèce est voisine du *B. schistaceus* (Boiss.), dont elle diffère principalement par le manque complet du miroir blanc à l'aile, par la couleur du sommet de la tête beaucoup plus pâle, par les moustaches noires moins développées, et par la couleur du dessous plus pâle; le bec est plus long et plus comprimé dans sa moitié terminale.

38. **Buarremon tricolor**, sp. nov. (Plate LXV.)

Olivaceus, subtus flavus; capitis lateribus nigricantibus, vertice ochraceo vel flavo. Rostrum nigricans; pedes brunnei; iris fusco-brunnea. Long. tota 165, *alæ* 79, *caudæ* 88, *tarsi* 27, *rostri a commissura* 19 *millim.*

Plusieurs exemplaires de Chilpes, Paltaypampa, Ninabamba, Pumamarca, et Tempobata.

Le dos est d'une couleur olive sombre, un plus claire au croupion; tout le dessous est jaune, passant en olive sur les côtés du ventre et les subcaudales; les côtés du visage sont noirâtres, entourant largement les yeux. Le sommet de la tête jusqu'à la nuque est occupé par une bande jaune ochracée, ou d'une nuance peu différente de celle du dessous. Les rectrices et les remiges sont brunes liserées d'olive, les bordures internes de ces dernières sont blanchâtres dans la moitié basale, et fauves dans la terminale; les subalaires grises jaunâtres.

C'est l'espèce très voisine du *B. pallidinuchus* (Boiss.), mais elle en diffère par la couleur de la bande céphalique plus jaune et moins étendue en arrière, par la couleur du dos plus verdâtre sans nuance brunâtre et par le jaune du dessous plus vif et plus pur sans taches foncées sur la gorge. Le bec est plus noirâtre et uniforme; tandis que dans l'espèce citée la mandibule inférieure est beaucoup plus claire que la supérieure.

39. **Hemispingus auricularis**, Cab. Journ. f. Orn. 1873, p. 318.

Plusieurs exemplaires de Maraynioc, de Paltaypampa, et de Sillapeta.

Le nid de cet oiseau est construit de grosses feuilles sèches de graminées et garni intérieurement de tiges très fines de mêmes plantes. La construction est simple, mais assez compacte et regulière, à parois peu épais. Hauteur 5 centim., largeur 9, diamètre de l'intérieur 6·5, profondeur 3·5.

Les deux œufs trouvés le 8 Avril 1872 dans ce nid, ont le fond rose pâle marqué de nombreuses taches et de traits d'un gris rougeâtre pâle, et d'autres rouges de brique pas trop foncées, un peu plus nombreuses au gros bout sur un de ces œufs, et également disposées partout sur l'autre. La tacheture ressemble à celle des œufs des alouettes. Dimensions: 22—16·4, 20·2—15·4.

40. **Chlorospingus cinereocephalus**, Tacz. P. Z. S. 1873, p. 132.

Femelle unique de Chilpes.

41. **Chlorospingus castaneicollis**, Scl. P. Z. S. 1858, p. 293.

Une femelle de Ropaybamba, tuée le 19 Decembre 1872.

42. **Chlorospingus chrysogaster**, sp. nov.

Capite colloque cinereis, dorso olivaceo-viridi, abdomine subcaudalibusque luteis, remigibus rectricibusque fuscis, viridi limbatis. Rostrum corneo-nigricans; iris griseo-brunnescens, pallida. Long. tota 144, *alæ* 80, *caudæ* 64, *tarsi* 20, *rostri a commissura* 14 *millim.*

Femelle unique tuée le 5 Avril 1873 à Tambapota.

Le dessus, les côtés de la tête et le cou sont d'un cendré foncé uniforme, tandis que la gorge et le haut de la poitrine sont d'une couleur grisâtre pâle, presque blanchâtre en bas; le dos est d'une belle couleur vert-olivâtre; le ventre ainsi que les subcaudales d'un jaune-jonquille, enduit de verdâtre sur les côtés du corps. Les remiges et les rectrices sont noirâtres, bordées d'une liseré de la couleur analogue à celle du dos, les bordures des primaires cependant sont plus jaunâtres, et grisâtres près de l'extrémité; les tertiaires sont enduites presque entièrement de la couleur du dos. Les grandes supralaires externes sont noirâtres, presque uniformes; les autres de la couleur du dos; les subalaires sont d'un jaune grisâtre pâle.

Le bec de cet oiseau est plus faible que dans les autres espèces, il est même moins fort que celui du *C. castaneicollis*, et ressemble beaucoup par sa forme au bec du *Microspingus trifasciatus*.

43. **Chlorospingus oleagineus**, Sclater.

Pumamarca, 9 Mars 1873, exemplaire unique.

44. **Microspingus trifasciatus**, Tacz. P. Z. S. 1874, p. 132, t. 19. f. 1.

Mâle unique de Maraynioc.

45. **Cissopis minor**, Tsch. Fn. Peru. Orn. p. 211.

Un mâle de Monterico.

46. **Saltator albicollis**, Vieill.

Une paire (♂ et ♀) de Lima.

47. **Saltator magnus** (Gm.); Vieill. Gal. Ois. t. 77.

S. olivaceus, Tsch. Fn. Peru. Orn. p. 209.

48. **Saltator laticlavius**, Scl. et Salv.

Un mâle de Maraynioc, une paire d'Arancocha.

Un nid trouvé le 26 Mai 1873, à Arancocha est construit de branchettes, de feuilles et de grosses herbes, de plus en plus fines en approchant de l'intérieur, qui est assez nettement arrangé de radicelles et de brins d'herbes, entrelacés avec soin; il y a aussi quelques crins de cheval. L'extérieur est grossier et irrégulier. Hauteur 9 centim., largeur 13, diamètre de l'intérieur 7, profondeur 5.

Les deux œufs que contenait ce nid sont oblongs, de forme ovée approchant de l'elliptique. Le fond est bleu verdâtre clair. Un de ces œufs a près du gros bout une petite couronne composée de quelques grosses taches noires et de quelques veines entortillées, grosses et fines, de même couleur. Sur le second il y a seulement quelques grosses taches isolées à la place de la couronne. Dimensions: 31·2—20·6 millim.

Ils ressemblent à ceux du *S. magnus*, mais ils sont plus grands, un peu plus pâles, à couronne composée de taches et de veines plus grosses.

49. Psittospiza elegans (Tsch.).

Saltator elegans, Tsch. Consp. Av. p. 150.
Saltator riefferi, Tsch. Fn. Peru. p. 210.

Quatre exemplaires de Maraynioc et de Pumamarca.

Cet oiseau décrit par Tschudi, ensuite confondu par le même auteur avec l'espèce de l'Ecuador, doit être considéré comme une forme distincte, un peu plus grande, à bec un peu plus court. Il diffère aussi constamment par la couleur rousse plus étendue au visage, elle forme une bande assez large au-dessus de l'œil, descend plus bas sur la gorge et occupe plus largement les côtés du visage. La raie bleue frontale est plus vive. Le vert du plumage général plus pur.

Le bec et les pattes sont d'une belle couleur rouge, qui change bientôt en jaune plus ou moins pâle, sur des individus exposés à la lumière. L'iris est roux, presque de la couleur du plumage environnant.

Longueur de l'aile pliée 113 millim.

50. Pitylus grossus (L.); Scl. et Salv. P. Z. S. 1873, p. 263.

Une femelle de Monterico.

51. Pipridea castaneiventris, Sclater.

Une paire de Sillapata et de Maraynioc.

52. Procnias occidentalis, Scl.; Scl. et Salv. P. Z. S. 1873, p. 260.

P. ventralis, Tsch. Fn. Peru. Orn. p. 196.

Une femelle de Monterico.

53. Euphonia nigricollis, Vieill.; Scl. et Salv. P. Z. S. 1873, p. 260.

Une paire de Paltaypampa.

54. Euphonia xanthogastra, Sund. Vet. Acad. Handl. 1833, t. 10. f. 1; Scl. et Salv. P. Z. S. 1873, p. 260.

Euphone chlorotica, Tsch. Fn. Peru. p. 195.

Plusieurs individus des deux sexes de Monterico et d'Amable-Maria.

Family Fringillidæ.

1. Pheucticus aureiventris (Lafr. et D'Orb.).

Plusieurs exemplaires de Huanta et de Maraynioc.

2. **Pheucticus chrysopeplus** (Vig.); Less. Cent. Zool. t. 67.

Coccoborus chrysogaster, Tsch. Fn. Peru. p. 222.

Un mâle de Chilpes.

3. **Spermophila telasco** (Less.); Tsch. Fn. Peru. p. 33.

Un mâle et deux femelles de Lima.

4. **Spermophila luctuosa** (Lafr.); Scl. et Salv. P. Z. S. 1873, p. 264.

Une paire de Monterico, un mâle de Higos.

5. **Spermophila gutturalis** (Licht.).

Phonipara gutturalis, Bp. Consp. i. p. 494.

Un mâle de Paltaypampa, et deux femelles de Chilpes et d'Amable-Maria.

6. **Spermophila simplex**, Tacz. P.Z.S. 1874, p. 132; Nation, P. Z. S. 1874, p. 329.

Une nombreuse suite d'exemplaires adultes et jeunes des environs de Lima.

Le nid de cet oiseau, placé sur une branche d'un buisson, est construit en entier de très fines radicelles, mêlées avec d'autres parties de plantes sèches également fines, parmi lesquelles il y a un nombre considérable de vrilles de plantes grimpantes, roulées en spirale régulière et serrée; l'extérieur est garni de quelques plumes et de quelques toiles et de cocons d'insectes; l'intérieur, qui est profond, est fortifié par quelques crins de cheval. La texture est peu compacte, transparente, mais assez solide. Hauteur 6·5, largeur 7, diamètre de l'intérieur 4·5, profondeur 4 centim.

Les œufs sont ovés, courts, à éclat très faible et ressemblent en coloration à certaines variétés des œufs de l'*Emberiza aureola*. Le fond est vert-olivâtre pâle, varié de nombreuses taches irrégulières de trois couleurs, c'est-à-dire grises pâles, olives, et foncées presque noires; les deux premières sont les plus nombreuses, les dernières en petit nombre formant pour la plupart des petits zigzags entortillés. Les taches sont également disposées sur toute la surface, où elles forment autour du gros bout une couronne plus ou moins dense, tandis qu'elles sont rares et peu signifiantes sur le reste de la surface. Dimensions: 17·3—13·4, 17·8—13 millim.

7. **Spermophila obscura**, sp. nov.

Olivaceo-grisea, subtus grisea; abdomine medio crissoque albidis, subcaudalibus subalaribusque fulvis. Rostri nigricantis mandibula inferior pallida; pedes carnei; iris fusco-brunnea. Long. tota 102, *alæ* 58, *caudæ* 40, *tarsi* 17, *rostri a commissura* 9 *millim.*

Mâle unique tué à Paltaypampa le 12 Mars 1872.

Cet oiseau fait effet d'une femelle, mais M. Jelski a indiqué sur son étiquette que c'est un mâle et que ses génitaux ont été très developpés. Tout le dessus est d'une couleur olive grisâtre uniforme, les remiges et la queue sont presque de même nuance, les bordures seulement des primaires sont considérablement plus claires tirant sur le vert jaunâtre. Le dessous est gris sombre d'une nuance peu différente de celle du dessus, excepté le milieu de la gorge et du ventre qui sont blanchâtres; les subcaudales et les subalaires sont fauves; le bord interne des remiges est fauve-grisâtre.

Le bec de cet oiseau est très-différent de celui des *Spermophili*, il est moins épais et peu renflé, à mandibule supérieure presque droite. Il ressemble plutôt à celui du *Catamenia homochroa*, mais il est encore plus conique.

8. Neorhynchus nasesus, (Bp.) P. Z. S. 1869, p. 146, pl. 12.

Plusieurs exemplaires des environs de Lima.

9. Catamblyrhynchus diadema (Lafr.).

Un mâle de Pumamarca, une femelle de Maraynioc.

10. Volatinia jacarina (L.); Scl. et Salv. P. Z. S. 1873, p. 264.

Spiza jacarina, Tsch. Fn. Peru. p. 220.

Une paire (♂ et ♀) des environs de Lima.

11. Cyanospiza, sp.?

Une femelle de Ropaybamba.

12. Poospiza torquata (Lafr. et D'Orb.).

Plusieurs exemplaires des environs de Lima.

13. Phrygilus gayi (Eyd. et Gerv.); Tsch. Fn. Peru. p. 218.

Des oiseaux adultes et jeunes de Maraynioc, d'Araneocha et de Junin.

Un nid trouvé le 27 Mai 1873, sur une pente perpendiculaire d'un rocher, dans un petit groseillier, est construit de branchettes et de fines radicelles, et garni abondamment au milieu de brins d'une graminée délicats, fins et courts, semblables à ceux du *Nardus*, mélangés avec un peu de laine employée sans ordre et comme par hasard, de quelques morceaux de mousse et quelques crins de cheval. La construction est assez solide et assez régulière. Hauteur 7, largeur 15, diamètre de l'intérieur 7, profondeur 4·5 centim.

Les trois œufs que contenait ce nid sont d'une belle couleur bleu-verdâtre, maculés de petites taches irrégulières brunes foncées, mélangées avec d'autres plus pâles, denses au gros bout et moins nombreuses sur le reste de la surface. L'éclat est assez fort. Dimensions: 23·6—16·5, 24—16, 24—16·2 millim.

14. Phrygilus ocularis, Scl. P. Z. S. 1858, t. 145.

Plusieurs exemplaires de Huanta et de Junin.

15. Phrygilus unicolor (Lafr. et D'Orb.); Tsch. Fn. Peru. p. 219.

Plusieurs exemplaires des deux sexes et des jeunes de Maraynioc et de Junin.

Les œufs trouvés le 10 Mai, 1873, ressemblent complètement à ceux du *Ph. gayii*, mais ils sont beaucoup plus courts, à coque moins lisse. Dimensions: 20—16, 21—15·5 millim.

16. PHRYGILUS ALAUDINUS (Kittl.).

Sporophila alaudina, Tsch. Fn. Peru. p. 222.

Nombreux exemplaires de Lima et de Huanta.

17. PHRYGILUS FRUTICETI (Kittl.).

Plusieurs exemplaires de Huanta et de Junin.

18. DIUCA SPECULIFERA (Lafr. et D'Orb.).

Trois exemplaires de Junin.

19. CATAMENIA ANALIS (Lafr. et D'Orb.).

Nombreux exemplaires des environs de Lima.

20. CATAMENIA HOMOCHROA, Scl. P. Z. S. 1858, p. 552.

Plusieurs individus de Maraynioc.

21. CATAMENIA RUFIROSTRIS (Landb.).

Nombreux exemplaires de Maraynioc.

22. ZONOTRICHIA PILEATA (Bodd.).

Z. matutina, Tsch. Fn. Peru. p. 214.

Plusieurs exemplaires de Lima, de Maraynioc et de Pumamarca.

23. COTURNICULUS PERUANUS, Bp. Consp. Av. i. p. 481; Scl. et Salv. P. Z. S. 1873, p. 264.

Plusieurs exemplaires de Monterico, d'Amable-Maria et de Ropaybamba.

24. PIPILO MYSTACALIS, sp. nov.

Griseus, fronte regioneque oculari nigricantibus, pileo brunnescente; gula late fulvo-albicante binis nigris mystacibus notata; medio abdomine, crisso, subcaudalibusque rufis, subalaribus fulvo-albidis. Rostrum nigricans; pedes cornei; iris brunnea. Long. tota 185, *alæ* 80, *caudæ* 85, *tarsi* 31, *rostri a commissura* 17 *millim.*

Mâle unique de Ninarupa aux environs de Junin.

Le plumage général de cet oiseau est gris, légèrement teint de brunâtre au milieu du dos, et d'une nuance beaucoup plus forte au sommet de la tête; le front et le haut des côtés de la tête sont noirs. La gorge et le bas des côtés du visage sont d'une couleur fauve blanchâtre avec une paire de courtes moustaches noires en dessous de la naissance de la mandibule inférieure. Le milieu du ventre, la région anale et les subcaudales sont d'une couleur rousse cannelle. Les subalaires sont fauves. Les remiges et les rectrices sont noirâtres bordées de gris, les bordures des primaires sont plus claires, celle de la troisième presque blanche; les barbes internes largement bordées de blanc.

Il y a quelques plumes blanches au front et sur d'autres parties du dessus de la tête, mais il paraît qu'elles sont accidentelles.

25. Sycalis uropygialis, Lafr. et D'Orb.

Plusieurs exemplaires adultes et jeunes, des œufs et des nids des environs de Junin.

Les nids trouvés pendant les mois de Mai et de Juin étaient placés dans les toits de chaume, dans des trous de murailles ou dans des fentes de rochers. Ils sont composés de deux couches bien distinctes: l'externe plus ou moins épaisse est composée de longues graminées sèches, l'interne également épaisse est faite de différents poils, soigneusement arrangée et lissée au milieu. Il y a aussi des nids composés seulement de poils sans couche superficielle. Un nid a été posé sur un ancien nid du même oiseau, les deux possèdent une couche de graminées et quelques plumes de poules dans la couche interne. Les dimensions varient selon la présence ou l'absence de la couche superficielle, mais celles de l'intérieur sont toujours les mêmes. Hauteur 5–5·5, largeur 9–11, diamètre de l'intérieur 5·5, profondeur 3·5 centim.

Les œufs sont beaucoup plus grands que ceux du *S. luteiventris*, ils sont plus ou moins allongés, ovés ou presque elliptiques. La couleur du fond est blanc verdâtre pâle, les taches rouges brunâtres, petites, nombreuses, disséminées sur toute la surface, ou plus nombreuses au gros bout, formant quelquefois une couronne assez dense; il y a aussi quelques uns qui outre la couronne sont très peu maculées sur le reste de la surface. Dimensions des œufs de différentes pontes: 20—14, 20·3—15, 21·3—14·2, 21·8—15·8, 22·8—14·3 millim.

26. Sycalis chloris, Cab. in Tsch. Fn. Peru. p. 216.

Un mâle de Huanta.

27. Sycalis luteiventris, (Meyen) Reis. iii. p. 211, t. 20. f. 3; Tsch. Fn. Peru. p. 216.

Sycalis luteola (part.), Scl. Ibis, 1872, p. 44.

Plusieurs exemplaires des environs de Lima.

Trois œufs de cet oiseau provenant d'une seule ponte, par leur forme, la grandeur et la coloration ressemblent à ceux du *Passer montanus*, variété claire, à taches peu nombreuses. Le fond est blanc, légèrement verdâtre, varié de petites taches brunes mêlées à d'autres d'un gris violacé pâle, également distribuées sur toute la surface. Sur un de ces œufs les taches sont plus grandes et moins nombreuses. Dimensions: 17·8—13, 18·2—13, 18·2—13·3 millim.

28. Sycalis raimondi, Tacz. P. Z. S. 1874, p. 133.

Trois exemplaires de Lima.

29. Chrysomitris capitalis, Cab.

Chrysomitris magellanica, Tsch. Fn. Peru. p. 220 (part.).

Plusieurs exemplaires de Lima, de Huanta et de Ropaybamba.

30. **Chrysomitris atrata** (Lafr. et D'Orb.).

Plusieurs exemplaires de Junin.

Les nids trouvés le 28 Avril et le 8 Juin 1873 se composent d'une couche irrégulière de mousse mélangée avec un peu de laine, quelques brins d'herbes sèches, des petites racines et des petites branchettes; sur cette couche est arrangé le nid même de laine et de différents poils; rarement il y a aussi quelques plumes. Toute cette construction est épaisse et assez solide; l'intérieur est peu profond mais soigneusement arrangé. Hauteur 4·5, largeur 13, diamètre de l'intérieur 4·5, profondeur 2·5 centim. M. Jelski les trouvait sous les toits de chaume.

Les œufs sont blancs verdâtres et présentent des différentes variétés en maculature, même parmi les exemplaires de la même ponte. Les trois œufs trouvés le 30 Avril sont sous ce rapport différents entre eux: un a au gros bout une couronne composée de très-petites taches rougeâtres, très-pâles et peu distinctes, et quelques plus foncées éparpillées sur toute la surface. Un autre a une pareille couronne près du gros bout et moins de taches foncées mais plus grandes sur la couronne, et point sur le reste de la surface. Sur le troisième la couronne est reduite à quelques petites taches, quelques points foncés et quelques veines tortueuses presque noires, dont une est étendue sur presque la moitié de la largeur de l'œuf. Un œuf d'une seconde ponte a au contraire une large couronne près du petit bout, composée de taches et de points foncés, et peu de points sur le reste de la surface; le gros beut est presque immaculé. Dimensions: 18·6—13·3, 19·2—13, 19·2—13·1, 19·6—13·6 millim.

Family Icteridæ.

1. **Cacicus atrovirens** (Lafr. et D'Orb.); Tsch. Fn. Peru. Orn. p. 230; Scl. et Salv. P. Z. S. 1873, p. 266.

Une femelle d'Amable-Maria.

2. **Cacicus cristatus** (Gm.); Tsch. Fn. Peru. Orn. p. 232.

Mâle et femelle de Monterico.

3. **Cacicus alfredi** (Desm.); Casteln. Voy. Am. Sud, Ois. t. 19. f. 2.

Plusieurs exemplaires adultes et jeunes de Monterico.

4. **Cassiculus chrysonotus** (Lafr. et D'Orb.).

Mâle adulte de Chilpes.

5. **Sturnella bellicosa**, De Fil.

Sturnella militaris, Tsch. Fn. Peru. Orn. p. 228.

Mâle adulte en mue des environs de Lima.

6. **Molothrus purpurascens** (Hahn)?; Cassin, Pr. Acad. Phil. 1866, p. 20; Scl. P. Z. S. 1869, p. 148.

Des jeunes et des œufs des environs de Lima et point d'oiseaux adultes, il est donc difficile d'indiquer l'espèce.

Family CORVIDAE.

1. XANTHURA PERUVIANA (L.). Tsch. Fn. Per. Orn. p. 232.

Plusieurs individus de Chilpes et de Ropaybamba.

2. CYANOCITTA JOLYAEA, Bp. Journ. f. Orn. 1853, p. 47.

Cyanocorax viridicyaneus, Tsch. Fn. Per. Orn. p. 233 (nec Lafr. et D'Orb.).

Une [illegible] de [illegible]. Cet exemplaire n'a rien de noir sur la gorge qui est d'une belle couleur indigo encadrée par devant et des côtés d'une [illegible] [illegible], et d'en bas d'un demi-collier subtil blanc [illegible] [illegible] d'un [illegible] [illegible] peu distinct et passant insensiblement au bleu de la poitrine. Il n'y a point de blanc autour des yeux ni sur le [illegible] du [illegible]. La nuance verdâtre sur le bleu du plumage est [illegible] faible.

Family DENDROCOLAPTIDAE.

1. GEOSITTA CUNICULARIA (Vieill.).

Plusieurs exemplaires de Junin.

2. GEOSITTA TENUIROSTRIS (Lafr. et D'Orb.).

Plusieurs exemplaires de Maraynioc.

3. GEOSITTA PERUVIANA, Lafr. Rev. Zool. 1847, p. 75.

Plusieurs exemplaires des environs de Lima.

4. GEOSITTA SAXICOLINA, sp. nov.

Supra fuliginoso-brunnea, vertice fusco substriato; fronte, superciliis [illegible] [illegible] lateribus rufescentibus; subtus isabellina, medio albicante; uropygio posteriore tectricibusque caudae [illegible]; caudae basi rufo-isabellina, apice brunnea. Rostri gracili, subrecto, nigricante, mandibula inferior albida; pedes nigricantes; iris fusco-brunnea. Long. tota 155–165, *alae* [illegible], *caudae* [illegible], *tarsi* 22, *rostri a commissura* 20–22 *millim.*

Plusieurs exemplaires des environs de Junin.

Cet oiseau est le plus voisin du *G. cunicularia*, mais il est plus grand, à bec moins long et moins courbé. La couleur des parties supérieures est plus brunâtre, teinte d'une nuance plus roussâtre; les stries brunâtres du dessus de la tête sont bien prononcées; le front est d'une couleur fauve roussâtre, ainsi qu'une large bande sourcilière, qui n'est pas aussi distinctement séparée des parties environnantes comme dans l'espèce citée, mais plus large et se confondant insensiblement avec les couleurs voisines; les côtés du cou sont presque de la même nuance. La gorge est blanche, le reste du dessous est d'une couleur isabelle, plus claire au milieu du ventre. Le bas-croupion, les couvertures supra- et subcaudales [illegible] [illegible] d'un isabelle roussâtre. Les ailes sont [illegible] [illegible] rémiges secondaires largement bordées de [illegible] [illegible] de toutes les rémiges [illegible] basale. Les rectrices sont d'une couleur isabelle roussâtre à la naissance et brune foncée à l'extrémité, de manière que les médianes sont foncées dans leur moitié, les autres de plus en plus diminuant; le bord de l'externe est blanchâtre.

Les jeunes individus, tués en Mai et en Juillet ont le bec plus court et parfaitement droit; il est tout noir excepté la naissance de la mandibule inférieure qui est claire en dessous. Toutes les remiges et les rectrices sont bordées de fauve à l'extrémité.

Les géosittes peuvent être considérées comme représentants dans les plateaux arides de l'Amérique méridionale des alouettes de l'ancien continent, dont une grande partie mène la vie dans des pareilles conditions. Elles présentent des grandes affinités aux différents groupes des alouettes. En général elles ont l'habitus de ces dernières, les remiges secondaires larges et souvent échancrées au bout, les tertiaires presque également longues, l'ongle du pouce allongé et peu courbé. Par leur corps trapu, et leur plumage abondant elles ressemblent aux cochevis et aux *Amnomanes*, tandis que par leur bec mince, plus ou moins long et courbé, elles ont beaucoup d'analogie aux *Certhilaudæ*, auxquelles la petite *G. peruviana* ressemble même par la tecture des pattes et la brièveté des doigts. Leur coloration a le plus d'analogie aux *Amnomanes*, aux *Certhilaudæ* et aux cochevis des deserts africains.

Plusieurs auteurs et voyageurs les ont décrit pour des alouettes, mais malheureusement on sait peu sur leurs habitudes. De l'autre côté il est juste que ces oiseaux ont des grandes affinités avec les différents groupes de la famille des Dendrocolaptides, et surtout aux *Cilluri*, aux *Furnarii* et aux *Upucerthiæ*, près desquels on les range dans le système. Elles constituent dans cette famille une représentation des alouettes, comme plusieurs autres groupes celles des Certhiadæ et des Cinclidæ.

5. UPUCERTHIA SERRANA, sp. nov.

Brunneo-grisea, uropygio, alis caudaque rufis; subtus grisea fulvescente striata; superciliis prælongis albidis; fronte fulvo striato, gula albida. Rostri nigricantis mandibula basi albida; pedes pallide brunnei; iris fusco-brunnea. Long. tota ♂ 220, *alæ* 89, *caudæ* 98, *tarsi* 32, *rostri* 33; ♀ 190, *alæ* 80, *caudæ* 86, *tarsi* 29, *rostri* 30.

Plusieurs exemplaires de Junin et d'Arancocha.

Le dessus de la tête et le dos sont d'une couleur grise brunâtre foncée, aux extrémités des plumes un peu plus claires; le front est varié de petites stries fauves; un sourcil fauve-blanchâtre s'étend sur toute la longueur de la tête et est plus large en arrière de l'œil qu'en avant. Le dessous est gris avec de longues stries fauves sur le milieu de chaque plume, de plus en plus larges vers le milieu du corps et très-fines sur les côtés; la gorge est fauve-blanchâtre tachetée de grisâtre. Le croupion, les ailes et la queue sont rousses; la barbe interne des remiges est brune, largement bordée de roux. Les subalaires sont fauves, les subcaudales roussâtres, variées de fauve.

6. **Upucerthia jelskii** (Cab.).

Coprotretis jelskii, Cab. Journ. f. Orn. 1874, p. 98.

Trois exemplaires de Junin.

7. **Cillurus nigrofumosus** (Lafr. et D'Orb.); Tsch. Fn. Peru. Orn. p. 253.

Un jeune mâle de Chorillos.

8. **Cillurus rivularis**, Cab. Journ. f. Orn. 1873, p. 319.

Plusieurs exemplaires de Junin.

9. **Cillurus bifasciatus** (Sclat.).

Upucerthia atacamensis, Philippi, Reise d. d. Wüste Atacama, p. 162, pl. 3.

Cinclodes bifasciatus, Scl. P. Z. S. 1858, p. 448, et 1873, p. 782.

Une paire de Junin.

10. **Cillurus palliatus**, Tsch. Fn. Peru. p. 235, t. 16. f. 2.

Trois exemplaires de Junin.

Ces oiseaux s'accordent complétement avec la descriptions et la figure de Tschudi, excepté la queue qui a moins de blanc à son extrémité et qui du reste n'est pas naturelle dans cette figure.

11. **Lochmias obscurata**, Cab. Journ. f. Orn. 1873, p. 65.

Un oiseau adulte et un jeune de Monterico.

12. **Sclerurus olivascens**, Cab. Journ. f. Orn. 1873, p. 65.

Unique exemplaire de Monterico.

13. **Phleocryptes melanops** (Vieill.); D'Orb. Voy. Am. Mér. t. 14. f. 1, 2.

Plusieurs exemplaires des environs du lac Junin.

Le nid de cet oiseau ressemble à celui du *Troglodytes europæus*, et comme ceux de notre *Calamoherpe turdoides* il est placé sur plusieurs tiges de joncs. Il est plus haut que large, couvert par dessus, approchant plus ou moins à la forme ellipsoïdale. Un petit trou d'entrée rond se trouve en haut d'un des côtés, et est abrité par dessus par une légère éminence. Les matériaux sont variés et bien choisis pour cette construction, c'est un mélange des différentes herbes et de graminées sèches, grosses pour la plupart, d'un certain nombre de fibres végétaux, des plumes et quelquefois de la mousse. Les parois sont épaisses, solides, tissus et entrelacés avec soin. L'intérieur est vaste, abondamment garni de plumes, pour la plupart de ceux de canards et de foulques. Les tiges qui supportent le nid sont enveloppées dans le tissu comme dans les nids des *Calamoherpes*. Hauteur [illegible], largeur [illegible], diamètre de l'entrée 3·5 centim.

Les œufs ont été recueillis dans la première moitié de Septembre, il y avait deux dans chaque ponte, et comme ils étaient tout frais, on ne peut pas savoir si elles étaient complètes. Ils sont d'une belle couleur bleue uniforme, la forme est ovoïde allongée, le lustre faible. Dimensions des œufs des deux pontes: (1) 25—16·4, 24·4—17 millim.; (2) 25—16, 23·4—16 millim.

14. **Leptasthenura andicola**, Scl.
Une paire de Junin.

15. **Synallaxis frontalis**, Pelz. Sitz. Ak. Wien, xxxiv. p. 117.
Synallaxis ruficapilla, Tsch. Fn. Peru. p. 239.
Un mâle de Ninabamba, une femelle de Paltaypampa.

16. **Synallaxis brunneicauda**, Scl. P. Z. S. 1874, p. 8.
Synallaxis brunneicaudalis, Scl. P. Z. S. 1858, pp. 62 et 457.
Un mâle d'Amable-Maria.

17. **Synallaxis curtata**, Scl. P. Z. S. 1869, p. 636, t. 49. f. 1, et 1874, p. 19.
Un mâle de St. Bartolomé.

18. **Synallaxis albicapilla**, Cab. Journ. f. Orn. 1873, p. 319.
Deux paires de Maraynioc.

19. **Synallaxis palpebralis**, Scl. P. Z. S. 1874, p. 16.
Schizœca palpebralis, Cab. Journ. f. Orn. 1873, p. 319.
Deux paires de Maraynioc.

20. **Synallaxis humilis**, Cab. Journ. f. Orn. 1873, p, 319.
Plusieurs exemplaires de Maraynioc.

21. **Synallaxis flammulata**, Jard. Contr. Orn. 1850, t. 56.
Deux mâles de Maraynioc.

22. **Synallaxis virgata**, Scl. P. Z. S. 1874, p. 446.
Une paire de Junin.

23. **Synallaxis pudibunda**, Scl. P. Z. S. 1874, p. 445, pl. lviii. fig. 1.
Un exemplaire d'Obraillo.

24. **Synallaxis graminicola**, Scl. P. Z. S. 1874, p. 446, pl. lviii. fig. 2.
Un exemplaire de Junin.

25. **Thripadectes scrutator**, Jelski, P. Z. S. 1874, p. 137.
Femelle unique de Maraynioc.

26. **Automolus ochrolæmus** (Tsch.); Fn. Peru. p. 240, t. 20. f. 2.
Philydor ochrolæmus, Scl. et Salv. P. Z. S. 1873, p. 269.
Un exemplaire de Monterico.

27. Automolus striaticeps, Sclater, MS.

Mâle unique de Chilpes.

28. Philydor subflavescens, Cab. Journ. f. Orn. 1873, p. 66.

Deux mâles de Monterico.

29. Philydor striaticollis, Scl. P. Z. S. 1857, p. 17.

Un mâle d'Amable-Maria, une femelle de Pumamarca.

30. Philydor montanus (Tsch.); Fn. Peru. p. 240, t. 20. f. 1.

Une femelle de Pumamarca.

31. Philydor, sp.?

Un exemplaire d'Amable-Maria.

32. Ipoborus stictoptilus, Cab. Journ. f. Orn. 1873, p. 66.

Un mâle de Monterico.

33. Pseudocolaptes boissonneauti (Lafr.); Scl. Nomencl. Av. Neotr. p. 65.

Anabates auritus, Tsch. Fn. Peru. p. 239.

Un mâle de Maraynioc.

34. Anabazenops cabanisi, sp. nov.

Supra fusco-olivacea; pileo obscuriore, fusco subsquamato; vitta superciliari rufo-aurantiaca, postice fulva; gula fulva fusco maculata; pectore abdomineque olivaceis fulvo striatis; cauda rufo-cinnamomea; subcaudalibus rufescente tinctis et fulvo striatis; subalaribus aurantiaco-rufis. Rostri nigricantis mandibula subtus albida; pedes fuscescentes; iris fusco-castanea. Long. tota 160, *alæ* 82, *caudæ* 80, *tarsi* 20, *rostri a commissura* 23 *millim.*

Un mâle tué à Pumamarca le 22 Février 1873.

Le dessus de cet oiseau est d'un olive foncé, plus sombre sur la calotte, dont les plumes sont bordées d'une nuance encore plus sombre, ce qui est aussi bien distinct sur la nuque, et beaucoup moins au dos. Une fine bande sourcilière s'étend depuis la naissance du bec sur toute la longueur de la tête, elle est d'une couleur rousse orangée au dessus de l'œil, et fauve en arrière; les côtes de la tête et du cou sont fauves, tachetés d'olive. La gorge est fauve parsemée de petites taches olives qui occupent l'extrémité de chaque plume; le reste du dessous olive, varié de longues stries fauves, larges au milieu du corps et fines sur les côtés, les subcaudales sont teintes de roussâtre. Les ailes sont presque concolores au dos mais légèrement enduites d'une teinte roussâtre; les remiges largement bordées de roux clair sur leur bord interne; les subalaires sont d'une belle couleur rousse orangee; la queue rousse cannelle.

35. XENOPS RUTILUS, Licht.; Tsch. Fn. Peru. p. 238; Scl. et Salv. P. Z. S. 1873, p. 270.

Des exemplaires de Ropaybamba et d'Anquimarca.

36. XENOPS LITTORALIS, Scl.?

Une paire de Monterico.

37. SITTASOMUS OLIVACEUS (Wied.); Scl. et Salv. P. Z. S. 1873, p. 270.

Sittasomus amazonus, Des Murs, Casteln. Voy. t. 15. f. 3.

Plusieurs exemplaires de Monterico, d'Amable-Maria et de Ropaybamba.

38. MARGARORNIS SQUAMIGERA (Lafr. et D'Orb.).

Une paire de Maraynioc.

39. DENDROCOLAPTES VALIDUS (Tsch.); Scl. et Salv. P. Z. S. 1873, p. 271.

Trois exemplaires de Monterico.

40. DENDRORNIS GUTTATUS (Licht.); Scl. P. Z. S. 1854, p. 110.

Un mâle de Monterico.

41. DENDRORNIS CHUNCHOTAMBO (Tsch.); Fn. Peru. p. 241, t. 22. f. 1.

Une paire (♂ et ♀) de Monterico.

42. DENDRORNIS OCELLATA, (Spix) Av. Bras. i. p. 88, t. 91. f. 1; Scl. P. Z. S. 1867, p. 755; Scl. et Salv. P. Z. S. 1873, p. 271.

Un mâle d'Amable-Maria.

43. PICOLAPTES LACRYMIGER (Lafr.); Des Murs, Icon. Orn. t. 70.

Trois exemplaires (♂, ♀ et jeune) de Ropaybamba.

Family FORMICARIIDÆ.

1. CYMBILANIUS LINEATUS (Vieill.); Scl. et Salv. P. Z. S. 1873, p. 272.

Une paire (♂ et ♀) de Monterico.

2. THAMNOPHILUS LUCTUOSUS, Tsch. Fn. Peru. p. 172.

Un mâle de Paltaypampa.

3. THAMNOPHILUS RADIATUS, Vieill. Enc. Méth. ii. p. 746; Scl. et Salv. P. Z. S. 1873, p. 273.

Thamnophilus doliatus, Tsch. Fn. Peru. p. 171.

Un mâle de Monterico, un second d'Amable-Maria.

4. Thamnophilus palliatus, Licht.; Tsch. Fn. Peru. p. 171.
Des exemplaires d'Amable-Maria, de St. Bartolomé et d'Anquimarca.

5. Thamnophilus, sp.?
Une femelle de Tamiapata.

6. Thamnistes rufescens, Cab. Journ. f. Orn. 1873, p. 65.
Un mâle d'Amable-Maria, une femelle de Monterico.

7. Dysithamnus semicinereus, Scl. P. Z. S. 1855, p. 90, t. 97.
Thamnophilus olivaceus, Tsch. Fn. Peru. p. 174, t. 11. f. 1 (♀).
Des exemplaires d'Amable-Maria, de Monterico et de Paltaypampa.

8. Dysithamnus ardesiacus, Scl. P. Z. S. 1867, p. 756; Scl. et Salv. P. Z. S. 1873, p. 274.
Une paire d'Amable-Maria.

9. Herpsilochmus rufimarginatus (Temm.); Cab. Wiegm. Arch. 1847, xiii. p. 224.
Un mâle de Monterico.

10. Herpsilochmus motacilloides, Tacz. P. Z. S. 1874, p. 136.
Une paire (♂ et ♀) de Maraynioc.

11. Myrmotherula atrogularis, Tacz. P. Z. S. 1874, p. 137.
Un mâle d'Amable-Maria, une femelle de Monterico.

12. Myrmotherula, sp.?
Deux femelles de Monterico.

13. Myrmotherula menetriesi (D'Orb.).
Plusieurs exemplaires d'Amable-Maria et de Paltaypampa.

14. Terenura callinota, Scl. P. Z. S. 1855, t. 96.
Une femelle de Ropaybamba.

15. Cercomacra tyrannina, Sclater.
Un mâle de Ropaybamba.

16. Pyriglena picea, Cab.
Formicivora atra, Tsch. Fn. Peru. p. 175.
Deux paires de Paltaypampa et de Ropaybamba.

17. Myrmeciza hemimelæna, Scl.; Scl. et Salv. P. Z. S. 1873, p. 275.
Un mâle d'Amable-Maria, une femelle de Monterico.

18. Hypocnemis subflava, Cab. Journ. f. Orn. 1873, p. 65.
Un mâle de Monterico.

19. **Hypocnemis pœcilonota**, Cab. Wiegm. Arch. 1847, xiii. p. 213; Scl. et Salv. P. Z. S. 1873, p. 276.

Une paire (♂ et ♀) de Monterico.

20. **Hypocnemis myiotherina** (Spix); Scl. P. Z. S. 1856, p. 253; Scl. et Salv. P. Z. S. 1873, p. 276.

Pithys leucophrys, Tsch. Fn. Peru. p. 176, t. 11. f. 2.

Un mâle de Monterico.

21. **Hypocnemis theresæ**, Des Murs in Castel. Voy. Ois. p. 51, t. 16. f. 2; Scl. et Salv. P. Z. S. 1873, p. 276.

Une paire (♂ et ♀) de Monterico.

22. **Pithys albifrons** (Gm.).

Plusieurs individus des deux sexes de Monterico, un jeune oiseau d'Amable-Maria.

Tous ces oiseaux diffèrent constamment des oiseaux de Cayenne par le manque complet de trait blanc en arrière de l'œil; les petites plumes du bord des paupières sont noires tandis qu'elles sont blanches dans l'autre; les plumes blanches de la huppe, du front et de la gorge sont moins développées et d'un blanc moins éclatant.

23. **Corythopis humivagans**, Tacz. P. Z. S. 1874, p. 136.

Un mâle d'Amable-Maria.

Cet oiseau est plus petit que le *C. torquata*, Tsch., et différent en plusieurs détails de la coloration, surtout en cette des subalaires, du front, du dessus de la tête, des côtés du ventre et des subcaudales. Il est de la taille du *C. nigrocincta*, Lafr., et il n'y a rien d'impossible qu'il ne soit identique, quoique on ne peut pas dire que la couleur du dos soit brunâtre, ainsi que celle des côtés du ventre brune.

24. **Conopophaga ardesiaca** (Lafr. et D'Orb.); Tsch. Fn. Peru. p. 179.

Un mâle de Soriano, une femelle de Masayacu.

25. **Chamæza olivacea**, Tsch. Fn. Peru. p. 178.

Un mâle de Mazayacu.

26. **Grallaria andicola** (Cab.); Journ. f. Orn. 1873, p. 318.

Plusieurs exemplaires de Maraynioc et d'Arancocha.

Family Pteroptochidæ.

1. **Scytalopus sylvestris**, Tacz. P. Z. S. 1874, p. 138; Sclater, Ibis, 1874, p. 195.

Un oiseau adulte de Paltaypampa et un jeune de Maraynioc.

Family Tyrannidæ.

1. **Agriornis maritima** (Lafr. et D'Orb.).

Agriornis leucurus, Gould, Voy. Beagle, Ois. t. 13.

Trois exemplaires de Junin, un de Huanta.

Le nid trouvé le 4 Novembre 1873, à Junin sous un égout d'un [illegible] est construit en entier de poil, qui, comme on le voit, [illegible] plus ou moins gros. Sous la [illegible] il y a un certain nombre [illegible] du nid. [illegible] l'intérieur même garni abondamment de [illegible] blanc et roussâtre, il y a aussi quelques [illegible]. La forme extérieure du nid est presque cylindrique à base [illegible]. L'intérieur est assez profond. Le tissu est assez solide; les [illegible] l'épaisseur. Hauteur du nid 7, largeur [illegible] diamètre de l'intérieur [illegible], profondeur 5 centim.

Les deux œufs [illegible] ce nid ressemblent à ceux du Loriol d'Europe. Leur forme est ovée, allongée, à petit bout plus ou moins [illegible] considérablement aminci. La [illegible] un peu moins fort que celui des œufs de Loriol. Couleur superficielle blanche pure, variée d'un [illegible] plus nombreuses près du gros bout. Dimensions: [illegible] millim.

2. [illegible] striaticollis, Scl. P. Z. S. 1851, t. 42.

[illegible] Lafr. et D'Orb.; Tsch. Fn. Peru. p. 153.

Une femelle d'[illegible].

3. Ochthodiaeta fumigatus, Boiss.; Scl. Nom. Av. Neotr. p. [illegible]

Deux femelles de Maraynioc et de Chilpes.

4. Ochthodiaeta signatus, sp. nov.

Supra [illegible], pileo obscuriore: subtus fusco flavidoque varius, [illegible] albido, subcaudalibus rufescentibus, [illegible] alis [illegible], fasciis albis notatis; rectricibus [illegible] rufo marginato. Rostrum pedesque [illegible]. Long. tota 140, *alæ* 79, *caudæ* 57, *tarsi* [illegible], *rostri a commissura* 20 *millim.*

Une femelle d'Amparaes et un jeune oiseau de Ninabamba.

Cet oiseau ressemble beaucoup à l'*O. fumigatus*, mais il est beaucoup plus petit. Le dessus du corps est d'une nuance semblable mais tirant un peu en olivâtre, le sommet de la tête plus foncé, les subcaudales brunes roussâtres. Le dessous du corps est jaunâtre très-pâle varié de grandes taches fumeuses dont la couleur prédomine sur la poitrine et sur les côtés, le milieu même du ventre est blanchâtre, les subcaudales roussâtres, les subalaires fauves. Les ailes sont de la couleur de la calotte, traversées de deux raies blanches formées par les bordures terminales des grandes couvertures. Les primaires sont bordées d'un fin liseré fauve grisâtre, les bordures des secondaires sont blanches sur la moitié terminale des pennes; la barbe interne dans toutes les rémiges est bordée de fauve blanchâtre, celle des rectrices est largement bordée de roux.

Le jeune oiseau diffère du précédent par la teinte des parties supérieures tirant sur le roussâtre, la calotte est concolore au dos, le croupion roux; les bandes alaires sont plus larges et fauves, ainsi que les bordures de la moitié terminale des remiges secondaires.

5. **Ochthœca polionota**, Scl. P. Z. S. 1869, p. 599.

Plusieurs exemplaires de Maraynioc.

6. **Ochthœca lessoni**, Scl.

Deux mâles de Maraynioc, un troisième de Pumamarca.

7. **Ochthœca thoracica**, Tacz. P. Z. S. 1874, p. 133.

Deux mâles de Higos et de Chilpes.

8. **Ochthœca leucophrys** (Lafr. et D'Orb.).

Un mâle de Huanta et deux exemplaires d'Arancocha.

9. **Mecocerculus tæniopterus**, Cab. Journ. f. Orn. 1874, p. 98.

Deux mâles de Sillapeta et de Maraynioc.

10. **Cnipolegus anthracinus**, Cab. Journ. f. Orn. 1859, p. 343.

Un mâle de Huanta.

11. **Copurus colonus** (Vieill.).

Copurus filicauda, Strickl. P. Z. S. 1841, p. 29; Tsch. Fn. Peru. p. 157.

Un mâle de Monterico, un autre de Paltaypampa.

12. **Muscisaxicola albifrons**, (Tsch.) Fn. Peru. p. 167, t. 12. f. 2.

Plusieurs individus de Ninarupa.

13. **Muscisaxicola cinerea**, Phil. et Landb.

Plusieurs exemplaires de Maraynioc.

14. **Muscisaxicola flavinucha**, Lafr. Rev. et Mag. Zool. 1855, p. 59, t. 3.

Plusieurs exemplaires de Junin.

15. **Muscisaxicola rubricapilla**, Phil. et Landb.; Scl. et Salv. P. Z. S. 1867, p. 986, t. 46.

Plusieurs exemplaires de Junin et de Maraynioc.

16. **Muscisaxicola rufivertex**, Lafr. et D'Orb. Voy. Am. M. t. 40; Tsch. Fn. Peru. p. 168.

Plusieurs exemplaires de Junin.

17. **Muscisaxicola rufipennis**, Jelski, P. Z. S. 1874, p. 134.

Femelle unique de Maraynioc.

18. Muscisaxicola maculirostris, Lafr. et D'Orb. Voy. Am. Mér. t. 41. f. 1.

Unique exemplaire des environs de Lima.

19. Muscisaxicola fluviatilis, Scl. et Salv. P. Z. S. 1866, p. 187. et 1873, p. 277.

Un mâle d'Amable-Maria, une femelle de Monterico et une d'[illegible].

20. Centrites oreas, Scl. P. Z. S. 1869, p. 154; Scl. et Salv. Ex. Orn. p. [illegible], pl. [illegible].

Plusieurs exemplaires de Junin.

Un nid de cet oiseau trouvé le 22 Juin 1873, à Junin au milieu d'une prairie humide, dans un endroit labouré par les cochons et caché sous une motte de gazon renversée de place, ressemble beaucoup à celui des [illegible]. A l'extérieur il est construit de mousse, de tiges et de racines de différentes herbes, plus ou moins dures; ensuite d'herbes plus délicates et de graminées, mélangées avec beaucoup de plumes et de duvet végétal. L'intérieur qui est profond est garni abondamment de grandes plumes de canards et de foulques, de manière qu'elles couvrent l'oiseau pendant l'incubation. La texture est assez serrée et assez solide. La forme est en cuvette profonde. Hauteur 6, largeur 9, diamètre de l'intérieur 5, profondeur 4·5 centim.

Les 3 œufs que contenait ce nid sont d'un blanc pur, avec quelques points brun-rouille, très-petits, presque invisibles, près du gros bout; sur un de ces œufs il y a une tache de cette couleur à peu près d'1½ millim. de diamètre. La forme est ovée allongée; la surface est polie à lustre médiocre; les pores nombreux distincts à la loupe. Dimensions: 21 sur 15 millim.

21. Muscigralla brevicauda, Lafr. et D'Orb. Voy. Am. Mér. t. 33. f. 2.

Ochthites brevicauda, Tsch. Fn. Peru p. 168.

Plusieurs exemplaires des environs de Lima.

L'œuf de cet oiseau est ové allongé, à coque délicate, surface polie, lustre médiocre. Couleur blanche, légèrement verdâtre avec un petit nombre de petites taches, de points et de zigzags d'un rouge pâle, presque également rares sur toute la surface et peu distinctes. Dimensions: 18·5 sur 12 millim.

22. Todirostrum cinereum (L.); Desm. Todid. t. 68.

Euscarthmus cinereus, Tsch. Fn. Peru p. 165.

Deux paires de Monterico.

23. Euscarthmus rufigularis, Cab. Journ. f. Orn. 1873, p. 67.

Une paire de Monterico.

Selon l'indication de M. Jelski l'iris est cendré à l'extérieur et blanchâtre autour de la prunelle.

24. **Euscarthmus pyrrhops**, Cab. Journ. f. Orn. 1874, p. 98.

Un mâle de Maraynioc et une femelle tuée à Tambapota le 15 Avril, 1873.

25. **Orchilus pileatus**, Tsch. Fn. Peru. p. 164, t. 9. f. 1.

Un oiseau adulte sans indication de sexe et un jeune de Ropaybamba. L'iris de l'adulte est blanc-chair, celui du jeune brun foncé tirant un peu sur le cendré.

26. **Pogonotriccus ophthalmicus**, Tacz. P. Z. S. 1874, p. 135.

Une paire (♂ et ♀) et un jeune d'Amable-Maria et de Ropaybamba.

27. **Serpophaga ruficeps**, (Lafr.) Mag. de Zool. 1844, t. 91.

Un examplaire de Pumamarca.

28. **Serpophaga cinerea** (Strickl.).

Un mâle des environs de Lima.

29. **Anæretes parulus** (Kittl.).

Plusieurs exemplaires de Maraynioc, d'Anquimarca et de Ninabamba.

Un nid trouvé le 2 Février dans cette dernière localité est construit d'herbes mélangées de lichens. À la base il y a de grosses feuilles de graminées aquatiques; les lichens prédominent sur la surface des côtés; l'intérieur est garni d'herbes délicates et de quelques petites plumes. La texture est serrée, l'intérieur est poli et comme collé. Hauteur 7, largeur 6·5, diamètre de l'intérieur 4, profondeur 4·5 centim. Ce nid ressemble beaucoup à ceux de nos Gobe-mouches, et il paraît qu'il a été placé sur une grosse branche près du tronc d'arbre.

L'œuf est blanc unicolore, de forme ovée médiocrement allongée. Dimensions: 17·2 sur 12·2 millim.

30. **Anæretes albocristatus**, Vig.

Anæretes reguloides, D'Orb. Voy. Am. Mér. t. 37. f. 1.

Une femelle des environs de Lima.

31. **Cyanotis azaræ** (Licht.).

Sylvia rubrigastra, Vieill. Enc. Méth. 480.

Regulus omnicolor, Vieill. Gal. Ois. ii. p. 271, t. 166.

Plusieurs exemplaires de Junin.

32. **Mionectes striaticollis** (Lafr. et D'Orb.).

Mionectes poliocephalus, Tsch. Fn. Peru. p. 148, t. 10. f. 1.

Des exemplaires de Paltaypampa et de Monterico.

33. **Leptopogon amaurocephalus**, Cab.; Scl. et Salv. P. Z. S. 1873, p. 278.

Un exemplaire de Monterico.

34. Leptopogon superciliaris, Tsch. Fn. Peru. p. 161, t. 10. f. 1.

Plusieurs exemplaires de Monterico, de Paltaypampa et de Ropaybamba.

35. Leptopogon [illegible], Tacz. P. Z. S. 1874, p. 134.

Un exemplaire d'Amable-Maria, une femelle adulte de Pumamarca, une jeune femelle de Ropaybamba.

36. [illegible] [illegible], Cab. Journ. f. Orn. 1873, p. 68.

Un mâle adulte de Monterico.

37. [illegible] [illegible], Cab. Journ. f. Orn. 1873, p. 67.

Une femelle de Monterico.

38. [illegible] pusillum, Cab. Mus. Hein. ii. p. 58; Scl. P. Z. S. [illegible], p. [illegible].

[illegible] [illegible], Scl. et Salv. P. Z. S. 1873, p. 278.

Plusieurs exemplaires des environs de Lima.

39. Tyranniscus viridiflavus, (Tsch.) Fn. Peru. p. 160, t. 9. f. 2.

Un mâle de Paltaypampa, une femelle d'Amable-Maria.

40. Tyranniscus nigricapillus (Lafr.).

Mâle unique de Pumamarca.

41. Tyranniscus cinereiceps, Scl.

Une paire de Ropaybamba.

42. Elainea albiceps (Lafr. et D'Orb.); Scl. et Salv. P. Z. S. 1873, p. 279.

Plusieurs exemplaires de Maraynioc, de Paltaypampa, de Tambopota et de Churay.

43. Elainea gigas, Scl. P. Z. S. 1840, p. 831.

Plusieurs exemplaires d'Amable-Maria et de Ninabamba.

44. Elainea obscura (Lafr. et D'Orb.); Tsch. Fn. Peru. p. 158.

Plusieurs exemplaires de Paltaypampa, de Pumamarca et de Ninabamba.

45. Elainea modesta (Tsch.), Fn. Peru. p. 159.

Nombreux exemplaires des environs de Lima et de Monterico.

Les nids de cet oiseau ressemblent beaucoup à ceux de nos *Curruca cinerea* et *C. garrula*. Ils sont bâtis de pareilles herbes sèches, ont la même forme et une pareille texture lache. L'intérieur est garni de quelques petites plumes ou de laine, et terminé de quelques crins de cheval. Hauteur 5·5–6, largeur 9–10, diamètre de l'intérieur 5, profondeur 3·5 centim.

Les œufs sont ovés, allongés, à coque délicate, à éclat très-faible. Fond blanc parsemé de rares points et de petites taches de couleur rouge-rouille, plus ou moins pâle, plus nombreuses au gros bout et presque nulles au petit; quelquefois ces taches forment une couronne assez distincte, quoique peu dense. Dimensions: 21—13·5, 21·3—15·2 millim.

46. **Myiozetetes similis** (Spix); Scl. et Salv. P. Z. S. 1873, p. 279.

Elainea cayanensis, Tsch. Fn. Peru. p. 158.

Mâle unique de Monterico.

47. **Rhynchocyclus fulvipectus**, Scl.

Une femelle de Ropaybamba.

48. **Rhynchocyclus peruvianus**, sp. nov.

Similis R. megacephalo *sed major, rostro minus dilatato, pileo plumbeo, fronte albicante, loris albidis, macula auriculari fusca. Rostri nigricantis mandibula albida ; pedes fusci ; iris rufo-grisea. Long. tota* 130, *alæ* 73, *caudæ* 60, *tarsi* 18, *rostri a commissura* 16 *millim.*

Un mâle tué à Ropaybamba le 17 Février, 1873.

Le dessus de la tête est d'une belle couleur plombée, le front enduit de blanchâtre, l'œil entouré d'un cercle blanc très-subtil; les côtés du visage et la gorge sont blanchâtres; l'oreille couverte d'une grande tache jaune, suivie d'une autre noirâtre. Le dessous du corps, les ailes et la queue sont comme dans la plupart des autres espèces.

49. **Myiodynastes solitarius** (Vieill.); Scl. et Salv. P. Z. S. 1873, p. 280.

Un exemplaire de Monterico.

50. **Myiodynastes luteiventris**, Scl.

Un jeune mâle de Monterico.

51. **Myiodynastes chrysocephalus**, (Tsch.) Fn. Peru. p. 150, t. 8. f. 1.

Un mâle adulte et un oiseau jeune de Ropaybamba.

52. **Hirundinea bellicosa** (Vieill.); D'Orb. Syn. Av. p. 46.

Myiarchus ferrugineus, Tsch. Fn. Peru. Orn. p. 154.

Une paire (♂ et ♀) de Ninabamba.

53. **Myiobius xanthopygius**, (Spix) Av. Bras. t. 9. f. 1.

Myiobius barbatus, Scl. et Salv. P. Z. S. 1867, p. 751.

Un exemplaire d'Amable-Maria.

54. **Myiobius cinnamomeus**, (Lafr. et D'Orb.) Voy. Am. M. t. 34. f. 1.

Une femelle de Maraynioc, un mâle et un jeune de Pumamarca.

55. **Myiobius erythrurus**, Licht.; Cab. Orn. Not. t. 5. f. 1; Scl. et Salv. P. Z. S. 1873, p. 281.

Un mâle de Monterico.

56. **Myiobius phœnicurus**, Scl. P. Z. S. 1854, t. 66. f. 1.

Femelle unique de Monterico.

57. **Myiobius rufescens** (Salv.).

Myiobius nationi, Scl. P. Z. S. 1866, t. 11. f. 1.

Une paire (♂ et ♀) des environs de Lima.

58. **Myiobius superciliosus**, sp. nov.

Olivaceo-viridis, subtus flavus, lateribus colli pectoreque virescentibus, vitta superciliari flava, remigibus rufescente marginatis. Rostrum nigricans; pedes brunnei; iris fusco-brunnea. Long. tota 117, *alæ* 62, *caudæ* 55, *tarsi* 16, *rostri a commissura* 15 *millim.*

Une femelle tuée à Ropaybamba le 2 Avril, 1873.

Par son mode de coloration cet oiseau ressemble beaucoup au *Basileuterus luteoviridis*, mais il diffère par le vert plus pur des parties supérieures et par le jaune plus pâle des parties inférieures du corps. La bande sourcilière est semblable mais moins prolongée en arrière de l'œil, et plus pâle; le milieu de la gorge est seulement jaune, ses côtés ainsi que celles de la poitrine sont teintes de verdâtre; au contraire il y a peu de cette couleur sur les côtés du ventre; au dessous de l'œil il y a aussi une tache jaune et une petite tache foncée devant l'œil. Les subalaires sont jaunes ainsi que les subcaudales. Les remiges sont bordées de roussâtre, ainsi que les grandes couvertures alaires; le bord interne des remiges est fauve-roussâtre, clair; les bordures des rectrices sont vertes olivâtres.

59. **Pyrocephalus rubineus** (Bodd.); Scl. et Salv. P. Z. S. 1873, p. 281.

Myiarchus coronatus, Tsch. Fn. Peru. p. 155, et *Myiarchus obscurus*, p. 156.

Plusieurs exemplaires des deux sexes en différents plumages des environs de Lima.

60. **Empidochanes fuscatus** (Max.); Cab. Journ. f. Orn. 1868, p. 195.

Une femelle de Monterico.

61. **Empidochanes pœcilurus**, Scl. P. Z. S. 1862, p. 112.

Un mâle d'Anquimarca, et un exemplaire sans indication de sexe de Paltaypampa.

62. **Mitrephorus ochraceiventris**, Cab. Journ. f. Orn. 1873, p. 320.

Une paire (♂ et ♀) de Maraynioc.

63. **Empidonax andinus**, sp. nov.

Fusco-cinereus; pileo, alis caudaque nigricantibus; gula, pectore medio, abdomine subcaudalibusque albis; lateribus griseis; fascia alarum duplici, marginibus secundariorum, et pogonio externo rectricum externorum cinerascenti-albidis; subalaribus grisescenti-fulvis. Rostri nigricantis mandibula inferior albida; pedes nigricantes; iris fusco-brunnea. Long. tota 140, *alæ* 72, *caudæ* 66, *tarsi* 16, *rostri a commissura* 16 *millim.*

Mâle unique des environs du lac Junin.

64. **Contopus plebeius**, Cab. Mus. Hein. ii. p. 71.

Deux mâles de Monterico.

65. **Contopus ardesiacus**, Cab. Journ. f. Orn. 1855, p. 179.

Tyrannula ardesiaca, Lafr. Rev. Zool. 1841, p. 80.

Deux paires de Paltaypampa et d'Anquimarca.

66. **Myiochanes cineracea**, Lafr.?

Deux exemplaires de Higos et d'Anquimarca.

67. **Myiarchus nigriceps**, Scl.

Deux paires de Maraynioc, de Paltaypampa et de Pumamarca.

68. **Myiarchus nigricans**, Cab.; Tsch. Fn. Peru. p. 153.

Un oiseau adulte et un jeune d'Amable-Maria, un jeune de St. Domiano.

69. **Myiarchus fasciatus**, Landb.

Une femelle adulte et un jeune oiseau de Huanta.

70. **Tyrannus melancholicus**, Vieill. N.D.H.N. xxxv. p. 49; Tsch. Fn. Peru. p. 151; Scl. et Salv. 1873, p. 281.

Plusieurs exemplaires de Chorillos, de Monterico et de Paltaypampa.

Family Pipridæ.

1. **Pipra chloromeros**, Tsch. Fn. Peru. p. 144.

Un mâle adulte, une femelle et un jeune mâle de Monterico et d'Amable-Maria.

2. **Pipra cæruleicapilla**, Tsch. Fn. Peru. p. 145.

Deux paires d'Amable-Maria et de Soriano.

3. **Hemipipo tschudii**, Cab. Journ. f. Orn. 1874, p. 99.

4. **Heteropelma wallacii**, Scl. P. Z. S. 1867, p. 579; Scl. et Salv. P. Z. S. 1873, p. 283.

Un mâle de Soriano.

Family COTINGIDÆ.

1. **TITYRA SEMIFASCIATA**, (Spix) Av. Bras. ii. t. 44. f. 2; Tsch. Fn. Peru. p. 146.

Deux mâles de Monterico.

2. **HADROSTOMUS AUDAX**, Cab. Journ. f. Orn. 1873, p. 68.

Une paire (♂ et ♀) de Monterico.

3. **PACHYRHAMPHUS VIRIDIS**, (Spix) Av. Bras. t. 45. f. 2.

Pachyrhamphus cuvieri (Sw.).

Une femelle d'Amable-Maria.

4. **PACHYRHAMPHUS VERSICOLOR**,(Hartl.)Rev.Zool.1843,p.289.

Une paire de Pumamarca.

5. **LIPAUGUS SIMPLEX** (Licht.); Scl. et Salv. P. Z. S. 1873, p. 284.

Un mâle de Monterico.

6. **RUPICOLA PERUVIANA**, Lath.; Scl. et Salv. P. Z. S. 1873, p. 285.

Rupicola peruana, Tsch. Fn. Peru. p. 142.

Des oiseaux adultes et jeunes de Soriano et de Monterico.

Selon l'indication de M. Jelski la prunelle des mâles adultes est subtriangulaire; l'iris est d'un cendré bleuâtre, clair, bordé des deux côtés d'un subtil liséré rouge miniacé, la prunelle même est entourée d'une bordure jaune très-fine. L'oiseau jeune en premier plumage a l'iris d'une couleur blanche sale.

7. **AMPELIO ARCUATUS**, (Lafr.) Mag. Zool. 1843, t. 40.

Deux paires de Maraynioc.

8. **PIPREOLA VIRIDIS** (Lafr. et D'Orb.).

Ampelis viridis, Lafr. et D'Orb. Voy. Am. M. t. 30; Tsch. Fn. Peru. p. 135.

Pipreola melanolæma, Sclater.

Deux mâles et une femelle de Maraynioc.

L'exemplaire typique (♀) des voyage d'Orbigny au Musée de Paris est complétement d'accord avec les exemplaires fournis par M. Jelski, il diffère seulement par une légère teinte bleuâtre au dos, ce qu'on voit aussi quelquefois sur des exemplaires de *P. riefferi*; le demi-collier est faiblement marqué sur la poitrine. La description de Tschudi s'applique aussi à une vieille femelle ou à un jeune mâle, car il y est dit que le front et les plumes de la base du bec sont noirâtres; le tour des yeux jaune-citron.

9. **HELIOCHERA RUBROCRISTATA**, (Lafr. et D'Orb.) Voy. Am. M. t. 31. f. 1; Tsch. Fn. Peru. p. 137.

Plusieurs exemplaires de Maraynioc.

10. **Doliornis sclateri**, Tacz. P. Z. S. 1874, p. 136. t. 20.

Mâle unique de Maraynioc.

11. **Cephalopterus ornatus**, Geoff.; Tsch. Fn. Peru. p. 141; Scl. et Salv. P. Z. S. 1873, p. 286.

Une femelle de Monterico.

Family Trochilidæ.

1. **Phaëthornis malaris** (Licht.); Gould, Troch. i. t. 17; Scl. et Salv. P. Z. S. 1873, p. 286.

Un mâle de Lima.

2. **Phaëthornis guyi**, (Less.) Troch. t. 44; Gould. Troch. i. t. 26; Tsch. Fn. Peru. Orn. p. 243.

Un mâle de Soriano.

3. **Eutoxeres condaminii**, Gould, Troch. ii. t. 6.

Un mâle de Pumamarca.

4. **Oreotrochilus melanogaster**, Gould, Troch. ii. t. 72.

Nombreux exemplaires en différents plumages de Maraynioc et des environs de Junin.

Un nid trouvé le 1 Mai, 1873, à Quebrada de Jachjas près de Junin, était dans une grotte collé aux inégalités d'une paroi. Il est tissé de laine mélangée avec de la mousse, quelques brins d'herbes délicates, quelques plumes et un peu de poil. La forme de ce nid est un cône renversé, très-long et irrégulier, à côté par lequel il était acroché aplati. Le nid même est beaucoup plus haut que large; outre cela il a encore en bas un prolongement aussi haut que le nid même, évidemment pour le mieux garantir sur une face perpendiculaire. Le tissu est épais, bien serré, mais grossier. L'intérieur est assez profond, garni de poils délicats, de plumes et de duvet. Hauteur de la construction entière 23 centim., largeur du nid 9, diamètre de l'intérieur 4, profondeur 3. Ce nid contenait deux petits.

5. **Campylopterus largipennis** (Bodd.); Gould, Troch. ii. t. 48.

Plusieurs exemplaires des environs de Lima.

6. **Petasophora anais** (Less.); Tsch. Fn. Peru. Orn. p. 244.

Plusieurs exemplaires de Huanta.

7. **Petasophora iolata**, Gould, Troch. iv. t. 205.

Plusieurs exemplaires de Soriano et d'Arancocha.

8. **Schistes geoffroyi** (Bourc. et Muls.); Gould, Troch. iv. t. 218.

Un mâle de Paltaypampa.

9. **LEUCIPPUS CHIONOGASTER**, (Tsch.) Fn. Peru. Orn. p. 247, t. 22. f. 2.

Plusieurs exemplaires de Soriano, Pampa Jesus et de Pumamarca.

Deux nids de cet oiseau-mouche trouvés aux environs de Pumamarca le 8 Mars et le 15 Avril, 1873, avec des œufs frais, sont construits en entier de duvet de plantes composées, mélangé et lié avec d'autres fibres végétaux plus ou moins longs. Le nid a la forme cylindrique, plus ou moins régulière. Le tissu est serré, solide et soigné; la surface extérieure est garnie d'une manière élégante de larges feuilles de lichens parfaitement appliquées à la surface; l'intérieur ne contient rien d'autre que du duvet des plantes composées. Hauteur 4·5 centim., largeur 4, diamètre de l'intérieur 3, profondeur 2.

10. **LEUCIPPUS PALLIDUS**, sp. nov.

L. chionogastri *similis, sed major, rostro longiore, coloribus dilutioribus, splendore aurato minùs distincto. Rostri nigricantis mandibula alba, nigro terminata; pedes brunnei; iris fusco-nigricans.*

Plusieurs exemplaires de Huanta, un de Soriano.

Cet oiseau-mouche est proche de *L. chionogaster*, mais parfaitement distinct: il est plus grand, à bec considérablement plus long, à couleur verte métallique des parties supérieures beaucoup plus faible, prenant une nuance grisâtre dans certaines directions de la lumière, surtout au sommet de la tête; la nuance dorée qu'elle prend dans d'autres directions est beaucoup plus faible et moins pure que dans l'espèce citée. Les côtés de la poitrine et du ventre sont aussi d'un vert métallique comme dans l'oiseau de Tschudi, mais d'un éclat plus faible et poudré de blanc. La queue est comme dans ce dernier, mais à parties vertes moins brillantes. L'éclat violacé sur les remiges est à peine distinct.

Les exemplaires de chacune des deux espèces tués dans des époques de l'année assez éloignées, présentent toujours la même nuance, tandis que sur les individus des deux espèces tués presque en même temps la différence est très-prononcée et facile à saisir au premier coup d'œil. Les exemplaires de Huanta de cette nouvelle espèce ont été pris le 15 Janvier, 1871, celui de Soriano le 10 Août de la même année. Les *L. chionogaster* sont tués le 26 Novembre, 1872, le 6 Janvier et le 9 Février, 1873.

Longueur totale 10·5 centim., aile pliée 6 cent., queue 3·5, bec depuis la commissure 2·8, tandis que dans le *L. chionogaster* il ne dépasse pas 2·5.

11. **THALURANIA TSCHUDII**, Gould, Troch. t. 103.

Trochilus furcatus, Tsch. Fn. Peru. Orn. p. 245; Scl. et Salv. P. Z. S. 1873, p. 287.

Un mâle de Soriano.

12. **THALURANIA JELSKII**, Tacz. P. Z. S. 1874, p. 138.

Un mâle de Soriano.

13. **Amazilia pristina**, Gould, Troch. v. p. 303; Tsch. Fn. Peru. Orn. p. 246.

Plusieurs exemplaires des environs de Lima.

14. **Thaumastura cora** (Less.); Garn. Zool. Coq. t. 13. f. 4; (Tsch.) Fn. Peru. Orn. p. 245; Gould, Troch. iii. t. 153.

Un jeune mâle de Lima.

15. **Lafresnaya gayi** (Bourc. et M.); Gould, Troch. ii. t. 86.

Deux mâles de Maraynioc et de Higos.

16. **Ionolæma schreibersi** (Bourc.); Gould, Troch. t. 93; Scl. et Salv. P. Z. S. 1873, p. 287.

Un exemplaire sans indication de sexe de Maraynioc.

17. **Docimastes ensiferus**, (Boiss.) Mag. Zool. 1840, t. 15; Gould, Troch. iv. t. 233.

Une paire de Maraynioc et une femelle de Higos.

18. **Leadbeatera otero**, (Tsch.) Fn. Peru. Orn. p. 249, t. 22. f. 2.

Une paire de Soriano et une femelle de Paltaypampa.

19. **Heliantheа dichroura**, Jelski, P. Z. S. 1874, p. 138.

Plusieurs exemplaires de Maraynioc et un de Paltaypampa.

20. **Pterophanes temminckii**, (Boiss.) Mag. Zool. 1840, t. 15; Gould, Troch. iii. t. 178.

Plusieurs exemplaires des deux sexes de Maraynioc.

21. **Bourcieria insectivora**, (Tsch.) Fn. Peru. Orn. p. 248, t. 23. f. 1.

Un mâle de Pumamarca, une paire de Chilpes.

22. **Lampropygia cœligena**, (Less.) Troch. t. 53; Gould, Troch. iv. t. 255.

Mâle et femelle de Soriano et de Paltaypampa.

23. **Heliangelus amethysticollis**, (Lafr. et D'Orb.) D'Orb. Voy. t. 60. f. 2; Tsch. Fn. Peru. Orn. p. 246; Gould, Troch. iv. t. 245.

Nombreux exemplaires des deux sexes et en différents plumages de Maraynioc.

24. **Lampraster branickii**, Tacz. P. Z. S. 1874, p. 140, t. xxi. f. 1.

Mâle unique de Monterico.

25. **Aglæactis caumatonotus**, Gould, P. Z. S. 1848, p. 12.

Une paire de Maraynioc.

26. **Aglaeactis castelnaudi** (Bourc. et Muls.); Gould, Troch. ii. t. 146.

Deux paires d'Arancocha.

27. **Panoplites matthewsi** (Bourc.); Gould, Troch. ii. t. 112.

Un mâle de Paltaypampa, un autre de Pumamarca.

Le nid recueilli le 25 Janvier, 1873, à Pumamarca est placé sur une mince branche horizontale. Il est construit de mousse de coton et de fibres végétaux. Il est petit, aussi haut que large, à tissu dense et solide; l'extérieur est garni en entier de lichens solidement appliqués et attachés à la surface. L'intérieur est assez profond et lisse, garni d'écailles de boutons de feuilles. Hauteur 4, largeur 4, diamètre de l'intérieur 2·5, profondeur 2 centim.

28. **Rhamphomicron microrhynchum**, (Boiss.) Mag. Zool. 1840, t. 16; Gould, Troch. iii. t. 189.

Deux mâles et une femelle de Anquimarca.

29. **Rhamphomicron olivaceum**, Lawr.

Nombreux exemplaires de Junin et de Maraynioc.

30. **Rhamphomicron stanleyi** (Bourc. et Muls.); Gould, Troch. iii. t. 185.

Une paire de Maraynioc.

31. **Metallura smaragdinicollis**, (Lafr. et D'Orb.) D'Orb. Voy. t. 59. f. 2; Gould, Troch. iii. t. 196.

Mâle unique de Maraynioc.

32. **Metallura hedvigæ**, Tacz. P. Z. S. 1874, p. 139, t. xxi. f. 2.

Urolampra eupogon, Cab. Journ. f. Orn. 1874, p. 97.

Plusieurs exemplaires de Maraynioc.

33. **Metallura cupreicauda**, Gould, Mon. Troch. iii. pl. 191.

Urolampra jelskii, Journ. f. Orn. 1874, p. 97.

Quatre exemplaires receuillis dans les montagnes des environs du lac Junin entre Cucas et Palcamayo et à Arancocha.

34. **Cynanthus mocoa** (Delattr. et Bourc.); Gould, Troch. iii. t. 173.

Deux paires de Chilpes, de Pumamarca et de Paltaypampa.

35. **Steganurus peruanus**, Gould, Troch. iii. t. 164.

Trochilus platurus, Tsch. Fn. Peru. Orn. p. 245 (exc. synon.).

Deux mâles de Paltaypampa, une femelle d'Amable-Maria.

36. **Acestrura mulsanti**, (Bourc.) Ann. Sc. Phys. Lyon. 1842, t. 20; Gould, Troch. iii. t. 145.

Nombreux exemplaires de Ninabamba.

37. **Aphantochroa hyposticta**, Gould, P. Z. S. 1862.

Un mâle de Soriano.

38. **Chlorostilbon brevicaudatus**, Gould, Introd. Troch. iii.

Deux mâles d'Amable-Maria.

39. **Patagona gigas**, Vieill. Gal. Ois. t. 180; Gould, Troch. iv. t. 232.

Une paire de Huanta.

40. **Eriocnemis sapphiropygia**, Tacz. P. Z. S. 1874, p. 139.

Deux mâles de Maraynioc.

Family Cypselidæ.

Chætura rutila (Vieill.).

Chætura brunneitorques, Lafr. Rev. Zool. 1844, p. 81.

Une paire d'Amable-Maria.

Family Caprimulgidæ.

1. **Chordeiles acutus**, Cass. Proc. Ac. Philad. v. p. 188.

Chordeiles pruinosus, Tsch. p. 130, t. 6. f. 2 (excl. synon.).

Plusieurs individus adultes et jeunes des environs de Lima.

2. **Nyctiphrynus ocellatus**, (Tsch.) Fn. Peru. p. 125, t. 5. f. 2.

Caprimulgus brasiliensis, Wied. Beitr. iii. p. 337.

Une femelle de Paltaypampa.

3. **Stenopsis bifasciatus**, Scl.

Caprimulgus decussatus, Tsch. Fn. Peru. p. 126, t. 5. f. 1.

Adultes et jeunes des environs de Lima.

4. **Stenopsis æquicaudatus**, Peale, United States Explor. Exp. p. 168.

Antrostomus æquicaudatus, Scl.

Trois exemplaires de Pumamarca.

5. **Hydropsalis lyra**, Bp. Consp. Av. i. p. 59; Cass. Journ. Ac. Philad. ii. p. 116, t. 13.

Jeune mâle de Pumamarca.

6. **Hydropsalis segmentatus**, Cass. Proc. Ac. Philad. iv. p. 236; Journ. Ac. Philad. ii. p. 117, t. 23.

Une mâle de Maraynioc.

Family Picidæ.

1. **Picumnus albosquamatus**, Lafr. et D'Orb., D'Orb. Voy. t. 64. f. 2 (sine descr.); Tsch. Fn. Peru. Orn. p. 264.

Mâle unique de Paltaypampa.

2. Picumnus aurifrons, Pelz.

Une paire (♂ et ♀) de Monterico.

3. Campephilus rubricollis (Bodd.); Gr. Gen. B. ii. 436.

Mâle et femelle de Monterico.

4. Campephilus melanoleucus (Gm.).

Dryocopus albirostris (Vieill.); Tsch. Fn. Peru. Orn. p. 43; Scl. et Salv. P. Z. S. 1873, p. 291.

Un mâle de Monterico.

5. Dryocopus hæmatogaster, Tsch. Fn. Peru. Orn. p. 265, t. 25.

Une paire de Chilpes.

6. Dryocopus lineatus (L.); Tsch. Fn. Peru. Orn. p. 43; Scl. et Salv. P. Z. S. 1873, p. 291.

Une femelle de Monterico.

7. Chloronerpes canipileus, (Lafr. et D'Orb.) D'Orb. Voy. t. 63. f. 2 (sine descr.); Malh. Mon. Pic. t. 90. f. 3 et 6.

Picus rubiginosus, Tsch. Fn. Peru. Orn. p. 268.

Une paire de Paltaypampa et un mâle de Ropaybamba.

8. Chloronerpes leucolæmus (Pelz.); Bp. Consp. Vol. Zyg. 9.

Un mâle de Monterico.

9. Chloronerpes fumigatus, (Lafr. et D'Orb.) D'Orb. Voy. t. 63. f. 1 (sine descr.); Tsch. Fn. Peru. Orn. p. 267.

Mâle unique de Paltaypampa.

10. Chloronerpes hæmatostigma (Natt.); Malh. Mon. Pic. t. 61. f. 6, 7; Scl. et Salv. P. Z. S. 1873, p. 291.

Une paire (♂ et ♀) de Monterico.

11. Melanerpes hirundinaceus (Gm.).

Melanerpes cruentatus, Malh. Mon. Pic. t. 98. f. 4, 6.

Un mâle de Monterico.

12. Colaptes rupicola, (Lafr. et D'Orb.) D'Orb. Voy. t. 62. f. 1 (sine descr.); Tsch. Fn. Peru. Orn. p. 269.

Une paire de la Sierra de Maraynioc.

13. Hypoxanthus brevirostris, sp. nov.

H. rivolii *similis, sed minor, rostro breviore, gula uropygioque nigris immaculatis. Rostrum nigrum; pedes plumbeo-nigricantes; iris brunnescenti-rubra.*

Mâle adulte de Higos, femelle de Chilpes.

Espèce bien distincte de *H. rivolii* de l'Equateur, par la taille plus petite, le bec beaucoup plus court, à l'arête de la mandibule supérieur fort arquée, et légèrement comprimé dans sa moitié terminale. La différence principale de coloration consiste en la gorge et le croupion noirs, sans aucune tacheture. La teinte jaune du ventre est plus pure, tandis qu'elle tire un peu en roussâtre dans l'espèce citée plus haut. Dimensions :—

	H. brevirostris.		*H. rivolii.*
	♂	♀	♂
	millim.	millim.	millim.
Longueur de l'aile	126	127	145
„ de la queue	108	110	115
„ du tarse....	24	22	26
„ du bec dep. com. ..	31	29	42
„ „ dep. nar. ..	21	20	27

Family ALCEDINIDÆ.

1. **CERYLE CABANISII**, Reich.; Sharpe, Alced. t. 16.

Alcedo cabanisii, Tsch. Fn. Peru. Orn. p. 253.

Mâle unique de Monterico.

2. **CERYLE AMAZONA**, (Vieill.) Nouv. Dict. xix. p. 399; Scl. et Salv. P. Z. S. 1873, p. 292.

Alcedo amazona, Tsch. Fn. Peru. Orn. p. 254.

Femelle unique d'Amable-Maria. Le bec de cet exemplaire est beacoup plus court que celui des oiseaux de Cayenne; les couvertures alaires sont terminées d'une petite tache blanche, il est donc probable que c'est un jeune individu.

Family MOMOTIDÆ.

CRYBELUS MARTII, (Spix) Av. Bras. ii. p. 64, t. 60; Tsch. Fn. Peru. Orn. p. 252; Scl. et Salv. P. Z. S. 1873, p. 292.

Femelle unique de Monterico.

Family TROGONIDÆ.

1. **TROGON HELIOTHRIX**, Tsch. Fn. Peru. Orn. p. 257.

Mâle unique de Marayuioc.

2. **TROGON COLLARIS**, Vieill.; Gould, Trog. t. 5; Scl. et Salv. P. Z. S. 1873, p. 293.

Un mâle de Monterico, un mâle et deux femelles de Soriano et d'Amable-Maria.

3. **CALURUS PAVONINUS**, (Spix) Av. Bras. t. 35; Scl. et Salv. P. Z. S. 1873, p. 293.

Femelle unique de Chilpes.

Family GALBULIDÆ.

1. **GALBULA TOMBACEA**, Spix, Av. Bras. i. p. 55, t. 58; Scl. et Salv. P. Z. S. 1873, p. 294; Tsch. Fn. Peru. Orn. p. 255.

Plusieurs individus de Monterico et une femelle de Paltaypampa.

2. **Galbula leucogastra** (Vieill.); Scl. et Salv. P. Z. S. 1867, p. 978, et 1873, p. 294.

Unique exemplaire de Monterico.

Family Bucconidæ.

1. **Monasa peruana**, Bp. et Verr.; Scl. P. Z. S. 1857, p. 262; Scl. et Salv. P. Z. S. 1873, p. 295.

Plusieurs exemplaires de Monterico.

2. **Malacoptila rufa**, (Spix) Av. Bras. t. 40. f. 1.

Lypornix rufa, Tsch. Fn. Peru. p. 257.

Deux femelles de Monterico. Les yeux sont selon M. Jelski rouges de sang.

3. **Nonnula ruficapilla**, (Tsch.) Fn. Peru. Orn. p. 258, t. 24. f. 1; Scl. et Salv. P. Z. S. 1873, p. 295.

Femelle unique d'Amable-Maria.

Family Cuculidæ.

1. **Crotophaga sulcirostris**, Sw.; Tsch. Fn. Peru. Orn. p. 256.

Une femelle des environs de Lima.

2. **Piaya nigricrissa**, Scl. et Salv. P. Z. S. 1866, p. 195.

Coccyzus cayanus, Tsch. Fn. Peru. Orn. p. 255 (?).
Mâle et femelle de Monterico et d'Amable-Maria.
L'iris est rouge.

Family Ramphastidæ.

1. **Ramphastos cuvieri**, Wagl.; Tsch. Fn. Peru. Orn. p. 261; Scl. et Salv. P. Z. S. 1873, p. 297.

Mâle unique de Monterico.

2. **Andigena cucullatus**, Gould, Ramph. 2nd ed. t. 40.

Une femelle de Pumamarca.

3. **Selenidera reinwardti** (Wagl.); Gould, Ramph. t. 26; id. 2nd ed. t. 35; Scl. et Salv. P. Z. S. 1873, p. 298.

Une paire (♂ et ♀) de Monterico.

4. **Aulacorhynchus atrogularis** (Sturm); Gould, Ramph. 2nd ed. t. 50.

Pteroglossus atrogularis, Tsch. Fn. Peru. Orn. p. 262.
Mâle et femelle de Monterico.

5. **Aulacorhynchus cæruleocinctus** (Lafr. et D'Orb.); Tsch. Fn. Peru. Orn. p. 263.

Une paire de Chilpes et de Ropaybamba.

6. AULACORHYNCHUS DERBIANUS, Gould, Ramph. t. 32; id. 2nd ed. t. 43; Tsch. Fn. Peru. p. 261.

Mâle de Monterico, femelle d'Amable-Maria.

Family CAPITONIDÆ.

1. CAPITO AURATUS (Dum.); Scl. et Salv. P. Z. S. 1873, p. 298.

Capito peruvianus, Scl. et Salv. P. Z. S. 1866, p. 195.
Capito amazonicus, Scl. et Salv. P. Z. S. 1867, p. 978.

Mâle et femelle de Monterico.

2. CAPITO GLAUCOGULARIS (Tsch.).

Capito erythrocephalus, Tsch. Fn. Peru. Orn. p. 260 (♂).
Capito glaucogularis, ibid. p. 259, t. 24. f. 2.

Deux mâles de Pucara, une femelle de Paltaypampa et une de Ropaybamba.

3. CAPITO AURANTIICOLLIS (Scl.); Scl. et Salv. P. Z. S. 1873, p. 298.

Mâle unique de Monterico.

Family PSITTACIDÆ.

1. ARA MILITARIS (L.); Less. Trait. Orn. 186.

Une tête d'Amable-Maria.

2. CONURUS MITRATUS, Tsch. Fn. Peru. p. 272, t. 26. f. 1.

Une paire (♂ et ♀) de Ninabamba et de Pumamarca.

3. CONURUS LUCIANI, (Deville) Voy. Casteln. t. 3. f. 1.

Un mâle de Monterico. Il diffère un peu en coloration de l'exemplaire typique; l'écaillure de la poitrine est plus subtile et rougeâtre dans le dernier, tandis qu'elle est jaune claire dans notre exemplaire.

4. BOLBORHYNCHUS AURIFRONS, (Less.) Cent. Zool. t. 18.

Conurus sitophaga, Tsch. Fn. Peru. p. 273.

Plusieurs individus des deux sexes des environs de Lima.

5. BOLBORHYNCHUS ORBIGNESIUS (Bp.).

Myiopsitta orbignesia, Bp. Rev. et Mag. Zool. 1854, p. 151.

Plusieurs exemplaires de Maraynioc, de Pumamarca et d'Arancocha.

Les exemplaires du Musée de Paris provenant du voyage D'Orbigny, portant le nom *Conurus temminckii*, Bp., sont identiques aux oiseaux de M. Jelski. L'extrémité du bec évidemment décolorée paraissait être également jaune; il manque au mâle de nuance bleue au dos qui est assez distincte sur nos exemplaires.

6. CHRYSOTIS FARINOSA, (Bodd.) Tabl. Pl. Enl. 52.
Psittacus pulverulentus, Gm. L. S. N. xiii. p. 341.
Mâle unique de Monterico.

7. CHRYSOTIS MERCENARIA, (Tsch.) Fn. Peru. Orn. p. 270, t. 27.
Mâle unique de Maraynioc.

8. PIONUS TUMULTUOSUS, (Tsch.) Fn. Peru. Orn. p. 270.
Une paire (♂ et ♀) de Chilpes.

Family FALCONIDÆ.

1. IBYCTER AMERICANUS (Bodd.); Scl. et Salv. P. Z. S. 1873, p. 301.
Mâle et femelle de Monterico.

2. MILVAGO MEGALOPTERUS (Meyen); Tsch. Fn. Peru. p. 78.
Phalcobœnus montanus, Lafr. et D'Orb. Voy. p. 51, t. 2. f. 1, 2.
Plusieurs individus des deux sexes de Junin et de Maraynioc.

3. GERANAËTUS AGUIA (Temm.).
Jeune mâle en premier plumage d'Amable-Maria.

4. FALCO ANATUM, Bp. Consp. Av. i. p. 23.
Femelle adulte de Junin, jeune femelle de Chorillos.

5. FALCO DEIROLEUCUS, Temm. Pl. Col. 348.
Une femelle de Pampa Jesus.
Confondu par Gray avec *F. aurantius*, Gm.! (Hand-list Birds Brit. Mus. 1869, p. 21. n. 185).

6. ÆSALON FEMORALIS, (Temm.) Pl. Col. p. 343; Tsch. Fn. Peru. p. 108.
Un mâle de Junin, un autre de Maraynioc.

7. TINNUNCULUS CINNAMOMINUS (Sw.).
Falco sparverius, Tsch. Fn. Peru. p. 110.
Mâle adulte de Lima, femelle de Huanta, une paire de Palcamayo.
Le mâle et une femelle n'ont point de tache rousse sur l'occiput, une femelle a à peine la trace de cette couleur, et une a une tache assez grande, mais pas aussi développée et aussi uniforme que dans le *T. sparverius*, L.

8. HARPAGUS BIDENDATUS (Lath.); Temm. Pl. Col. 38; Spix, Av. Bras. t. 6, 7.; Tsch. Fn. Peru. p. 107.
Mâle adulte de Monterico.

9. REGERHINUS MEGARHYNCHUS, Kaup; Casteln. et Deville, Voy. Ois. p. 1, t. 1.

Quatre exemplaires fournis en 1871 par M. Jelski d'Amable-Maria et de Soriano (aux environs de Tarma); c'est à dire un mâle adulte, deux femelles adultes, et un jeune oiseau changeant son premier plumage.

Ces oiseaux s'accordent complétement avec le type de Castelnau (♂ tué à Sarayacou au Pérou oriental en 1847, et déposé au Musée de Paris); excepté la coloration, qui paraît être aussi variable que dans les autres espèces de *Cymindis*.

Une de ces femelles a tout le plumage noir brunâtre presque uniforme; les plumes du dessus de la tête et de la nuque sont blanches dans les deux tiers de la longueur et de la couleur générale nettement tranchée de la précédente au bout; le front et le devant du visage est enduit de cendré grisâtre. La queue est noire, traversée dans la deuxième moitié de sa longueur d'une large bande grise en dessus et fauve en dessous, et d'une autre moins large et moins régulière près de la naissance, outre cela toutes les rectrices sont terminées d'une bordure grise, lisérée de blanc. Les tiges de toutes les rectrices sont en dessus noires, et blanches seulement sur la grosse bande claire, tandis qu'en dessous elles sont blanches, et seulement noires sur la bande foncée terminale. Les remiges sont barrées transversalement de noir et de blanc sur leur face inférieure, tandis que sur la supérieure les bandes claires sont de la teinte du plumage général. Les supra- et les subcaudales sont terminées d'une bordure blanche.

Selon l'indication de M. Jelski la peau nue devant les yeux est d'un jaune presque orangé; la cire est jaune verdâtre tirant un peu en bleu sur les côtés, olivâtre plus foncée au dos et au-dessus des narines. La mandibule supérieure est noire, l'inférieure jaune. Les pattes jaunes de carotte; les ongles noirs. L'iris blanc avec une légère nuance jaunâtre.

Le mâle et l'autre femelle ont le dessus comme l'oiseau précédent, mais tirant un peu sur le cendré; la tête cendrée bleuâtre au front, sur les côtés et sur la gorge, tandis qu'elle est noirâtre en dessus; la nuque est traversée d'un demi-collier d'un roux cannelle vif. La base des plumes de l'occiput est aussi blanche comme dans la femelle précédente, et fauve dans les plumes du demi-collier. Tout le dessous du corps est barré transversalement de blanc et de roux foncé, de sorte que cette dernière couleur prédomine sur la gorge et la poitrine, les bandes blanches au ventre sont presque aussi larges que les rousses; chacune de ces raies foncées est lisérée de deux côtés d'une mince bordure noirâtre. La queue a trois bandes claires, qui sont grises en dessus, et fauves en dessous. Les remiges sont également barrées, mais les raies claires près des extrémités de plusieurs primaires postérieures sont d'un roux cannelle plus ou moins intense. Les subalaires et les subcaudales sont fauves, ondulées de gris foncé. Le bec, l'iris et les pattes comme dans la femelle précédente.

L'oiseau jeune est brun en dessus, à couvertures alaires et les scapulaires terminées d'un liseré roux. Tout le dessous, le demicollier nuchal et les côtés de la tête sont blancs. La queue est traversée de 6 bandes grises en dessus et fauves en dessous. Les bandes aux remiges sont plus fines que celles des adultes, avec du roux comme dans les oiseaux précédents. Les culottes ondulées de foncé. Le bec est noir, à naissance de la mandibule inférieure jaunâtre. L'iris brun.

Dimensions.

	Ois. de Casteln.	Oiseaux du Pérou.			
		♂.	♀ rayée.	♀ brune.	♂ jeune.
Longueur de l'aile........	290	296	300	308	290
„ de la queue	197	210	225	220	210
„ du tarse........	37	37	37	37	30
„ du bec depuis la commissure	35	35	43	43	35
„ du bec depuis les narines	30	30	37	37	27
Hauteur du bec au-dessus des narines..........	25	21	24	24	19

Quelques nouvelles plumes que prend le jeune oiseau sur la poitrine et au ventre sont rayés transversalement de brun, et celles qui poussaient au collier nuchal sont rousses, ce qui indique que les oiseaux barrés de roux, dont je viens de décrire, sont dans leur deuxième livrée. Cette opinion est approuvée sur le mâle, qui possède encore parmi les couvertures alaires quelques plumes bordées comme dans le jeune de roussâtre. Les raies transversales des plumes fraiches du jeune sont minces et correspondent aux liserés foncés des adultes; elles sont bordées d'une légère nuance roussâtre, il est donc probable que le ton roux foncé des raies se forme graduellement sur ces plumes, et remplit de cette manière l'espace compris entre les deux raies foncées.

L'oiseau dans la livrée uniforme est evidemment plus adulte. Celui de Castelnau, semblable à certains *Cymindis uncinatus*, cendré foncé en dessus et rayé transversalement de cendré et de blanc en dessous, serait probablement dans une livrée intermédiaire entre les barrés de roux et les unicolores. Cette conjecture peut être juste, si les livrées de cet oiseau sont régulières et constantes; mais peut-être qu'elles sont aussi variables comme dans la Bondrée européenne, où il est impossible de comprendre toutes les variations que présentent ces oiseaux dans leurs différents âges.

10. **Ictinia plumbea** (Vieill.); Tsch. Fn. Peru. p. 112; Scl. et Salv. P. Z. S. 1873, p. 303.

Un mâle d'Amable-Maria.

11. **Buteola brachyura** (Vieill.).

Asturina albifrons, Kaup, Mus. Frankf.; Bp. Consp. Av. p. 31.

Une paire (♂ et ♀) d'Amable-Maria. La femelle n'a point de blanc au front.

12. **Asturina magnirostris** (Gm.); Temm. Pl. Col. 86; Tsch. Fn. Peru. p. 104; Scl. et Salv. P. Z. S. 1873, p. 303.

Une femelle de Monterico.

13. **Micrastur concentricus** (Less.).

Climacocercus concentricus, Tsch. Fn. Peru. p. 98.

Un jeune mâle en plumage de transition d'Amable-Maria.

14. **Circus histrionicus**, Q. et G. Voy. Uran. t. 15 et 16.

Circus poliopterus, Tsch. Fn. Peru. t. 3.

Nombreux exemplaires des deux sexes et de différents âges des environs du lac Junin.

Family Strigidæ.

1. **Athene cunicularia** (Molin.).

Noctua urucurea, Tsch. Fn. Peru. p. 116.

Plusieurs individus des deux sexes des environs de Lima, trois de Junin.

Les oiseaux de ces deux localités présentent une grande différence de taille et de la garniture des pattes. Ceux de Lima sont plus petits et ont le tarse garni sur la face antérieure de très-petites plumes, tandis que la postérieure est tout-à-fait à découvert; les doigts sont parsemés de rares soies roides. Les oiseaux de Junin sont considérablement plus grands, les plumes au tarse sont abondantes et touffues en le couvrant complétement tout autour, la chevelure aux doigts est beaucoup plus développée.

Dimensions.

	Ois. de Lima.			Ois. de Junin.	
	♂.	♀.		♂.	♀.
Longueur de l'aile	170	167	....	216	200
„ de la queue ..	86	88	....	110	105
„ du tarse	45	45	....	48	46

2. **Athene ferruginea**, (Max.) Beitr. iii. p. 234; Tsch. Fn. Peru. p. 117.

Une femelle des environs de Lima.

3. **Strix perlata**, Licht. Doubl. Verz. n. 613; Tsch. Fn. Peru. p. 121; Scl. et Salv. P. Z. S. 1873, p. 303.

Un exemplaire de Monterico.

Family Pelecanidæ.

1. **Onocrotalus thagus**, (Molin.) H. Nat. Chili, p. 212; Tsch. Fn. Peru. Orn. pp. 55 et 312.

Une femelle de Chorillos.

2. **Graculus brasilianus**, Bp. Consp. Av. ii. p. 172.

Phalacrocorax brasiliensis, Scl. et Salv. P. Z. S. 1873, p. 304.

Un jeune oiseau de Junin.

3. **Graculus gaimardi**, Less. Voy. Coquille, Ois. t. 48.

Haliæus gaimardi, Tsch. Fn. Peru. Orn. pp. 55 et 313.

Une paire de Chorillos.

4. **Graculus bougainvillei** (Less.); Bp. Consp. Av. ii. p. 176.
Haliæus albigula, Tsch. Fn. Peru. Orn. pp. 55 et 313.
Un mâle de Chorillos.

5. **Sula variegata** (Tsch.).
Dysporus variegatus, Tsch. Fn. Peru. Orn. p. 313.
Un jeune oiseau de Chorillos.

Family ANATIDÆ.

1. **Chloephaga melanoptera**, Eyt. Voy. Beagle, t. 50.
Anser melanopterus, Tsch. Fn. Peru. Orn. p. 308.
A. montanus, Tsch. Wiegm. Arch. 1843, i. p. 390.
A. anticola, Tsch. Consp. Av. n. 342.
Deux paires des environs de Junin.

2. **Dafila oxyura**, Meyen, Nov. Act. Acad. Leop. xvi. Suppl. 122, t. 26.
Anas spinicauda, Vieill.
"*Pato jerga*" des habitants de la contrée.
Une paire de Junin.

3. **Anas cristata**, Gm.
Anas lophyra, Forst. Descr. An. 340.
A. pyrrhogaster, Meyen, Nov. Act. Ac. Leop. xvi. Suppl. 119, t. 25.
"*Pato real*" des habitants de la contrée.
Deux paires et des poussins de Junin.

4. **Querquedula cyanoptera** (Vieill.).
Un mâle de Laguna Villa près de Chorillos.

5. **Querquedula oxyptera**, (Meyen) Nov. Act. Ac. Leop. xvi. Suppl. 121, t. 26; Tsch. Fn. Peru. Orn. p. 55.
"*Pato sutschu*" des habitants de la contrée.
Plusieurs exemplaires et des œufs de Junin.

6. **Querquedula puna** (Licht.); Tsch. Fn. Peru. Orn. p. 309; Scl. et Salv. Ex. Orn. pl. xcix.
"*Pato liaksa*" des habitants de la contrée.
Plusieurs exemplaires, des poussins et des œufs de Junin.

7. **Erismatura ferruginea**, Eyt. Monogr. Anat. 170.
Anas ferruginea, Burm. Syst. Ueb. Th. Bras. iii. p. 440.
Une paire et des œufs de Junin.

8. **Merganetta leucogenys**, Tsch. Fn. Peru. Orn. p. 310, t. 36.
Mâle et femelle de Maraynioc.

Family ARDEIDÆ.

1. **EGRETTA LEUCE**, Bp. List of Am. B. p. 47.

Ardea egretta, Wils. Am. Orn. vii. p. iii, t. 61. f. 4 ; Tsch. Fn. Peru. Orn. pp. 49 et 297 ; Scl. et Salv. P. Z. S. 1873, p. 305.

Un jeune exemplaire de Junin.

2. **NYCTICORAX AMERICANUS**, Bp. List of Am. B. p. 48 ; Tsch. Fn. Peru. Orn. pp. 50 et 297.

Une paire de Junin.

Family COLUMBIDÆ.

1. **LEPIDŒNAS SPECIOSA** (Gm.) ; Bp. Consp. ii. p. 48 ; Scl. et Salv. P. Z. S. 1873, p. 306.

Un mâle d'Amable-Maria.

2. **CHLORŒNAS DENISEA**, (Temm.) Pl. Col. 502 ; Bp. Consp. ii. p. 51.

Une paire de Maraynioc et d'Anquimarca.

3. **CHLORŒNAS PLUMBEA** (Vieill.) ; Bp. Consp. ii. p. 53.

Plusieurs exemplaires de Monterico et d'Amable-Maria.

4. **CHAMÆPELIA AMAZILIA**, Bp. Consp. ii. p. 78 ; Scl. et Salv. P. Z. S. 1873, p. 306.

Un exemplaire des environs de Lima.

5. **TALPACOTIA GODINA**, Bp. Consp. ii. p. 79.

Un exemplaire d'Amable-Maria.

6. **COLUMBULA CRUZIANA** (Knip et Prévost) ; Bp. Consp. Av. ii. p. 8.

Chamæpelia gracilis, Tsch. Fn. Peru. Orn. p. 277, t. 30.

Nombreux exemplaires de Lima, Chorillos et Huanta.

7. **ZENAIDA AURICULATA**, (Gay) Fn. Chil. pp. 378 et 381. sp. 1 ; Bp. Consp. Av. ii. p. 82.

Zenaida aurita, Tsch. Fn. Peru. Orn. p. 45.

Un mâle de Chorillos, un autre de Huanta et un jeune de Lima.

8. **METRIOPELIA MELANOPTERA** (Molin.) ; Bp. Consp. ii. p. 76.

Un mâle d'Arancocha.

9. **GYMNOPELIA ERYTHROTHORAX**, (Meyen) Nov. Act. Ac. Leop. 1833, Supp. 98, t. 26 ; Scl. et Salv. Nom. Av. Neotr. p. 133.

Columba monticola, Tsch. Consp. Av. n. 267 ; *id.* Fn. Peru. pp. 45 et 276.

Une paire tuée entre Cucas et Palcamayo.

10. **Leptoptila rufaxilla**, Rich. et Bern.; Bp. Consp. ii. p. 75.

Columba jamaicensis, Tsch. Fn. Peru. pp. 45 et 275.

Un mâle de Monterico.

11. **Geotrygon frenata**, (Tsch.) Fn. Peru. p. 278, t. 28.

Une paire d'Amable-Maria et un exemplaire d'Anquimarca.

12. **Geotrygon montana** (L.); Bp. Consp. ii. p. 72; Scl. et Salv. P. Z. S. 1873, p. 306.

Un mâle de Monterico.

Family Thinocoridæ.

1. **Thinocorus ingæ**, Tsch. Fn. Peru. Orn. p. 279.

Plusieurs exemplaires des deux sexes, des poussins et des œufs des environs de Junin.

Les œufs sont ovoconiques comme ceux de *Scolopacides* et des *Charadriides*. Ils sont de la forme et de la grandeur des œufs de *Totanus ochropus*, et par leur coloration ils ressemblent le plus à ceux de l'*Actitis hypoleucos*, ils ont le fond également isabelle, les taches d'un brun très-foncé, mélangées avec d'autres d'un gris violacé pâle. En les examinant plus attentivement on voit que la maculature est bien différente de celle des œufs des deux familles citées. Les taches sont plus petites et plus nombreuses, constituant des points, des traits et des zigzags plus ou moins subtils, formant une couronne plus ou moins dense autour du gros bout, et plus ou moins nombreuses sur le reste de la surface. La surface de la coque présente une différence plus notable, elle est beaucoup plus polie que dans tous les œufs des échassiers des familles citées, la structure de la coque est beaucoup plus compacte, les inégalités beaucoup plus petites.

M. des Murs se guidant par la ressemblance superficielle des caractères oologiques a rangé la tribu des *Thinocorides* dans l'ordre des Gralles, parmi les *Cariamides* et les *Charadriides*. Pour appuyer son opinion il cite un passage de Lafresnaye*, dans lequel à vrai dire il n'y a qu'un seul argument qui serait: "les matelots du 'Beagle' les appelaient les Bécassines à bec court," tandis que les autres détails prouvent que ce sont des Gallinacés. Plusieurs autres ornithologistes éminents sont d'accord avec M. des Murs; G. R. Gray dans sa dernière édition du 'Catalogue du Musée Britannique' les a placés parmi les familles des *Glareolides* et des *Chionides*.

En comparant les œufs de *Thinocorus* avec ceux des Gangas (*Pterocles*) on voit qu'ils diffèrent seulement par la forme (cylindrique dans ces derniers), et que tout les autres caractères sont communs: la structure et la surface de la coque, ainsi que la coloration. Il serait donc bien plus naturel de considérer les œufs des *Thinocorides* comme représentant dans l'ordre des Gallinacés ce que sont les œufs des Guillemots dans l'ordre des Palmipèdes, également comme le dit M. des Murs par rapport aux œufs de *Pteroclides* "ces œufs représentant exactement dans l'ordre des Gallinacés ce que sont les œufs d'Engoulevents dans l'ordre de Passereaux "*. On pourrait citer une quantité de pareils exemples.

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* Traité général d'Oologie Ornith. p. 370.

La comparaison des oiseaux mêmes démontre beaucoup plus d'analogies entre les familles de *Pteroclides* et des *Thinocorides*. Les formes générales sont presque les mêmes, la poitrine également proéminente; les ailes également longues et aiguës présentent seulement cette différence, que quoique les tertiaires sont longues dans les premiers, elles n'atteignent pas cependant l'extrémité des primaires comme dans les *Thinocorides*; la queue dans les deux est conique, quoique les deux rectrices médianes ne sont jamais effilées dans les derniers; la structure des plumes est presque la même; ou peut même trouver plus d'analogies en coloration de ces deux familles qu'entre les *Thinocores* et les Echassiers; le seul détail serait important que les sexes sont différentes entre elles, ce qui est très-rare et exceptionnel parmi les Echassiers. Le bec présente presque la même forme, les narines sont également emplumées en dessus et garnies d'un opercule charnu. Les pattes sont plus différentes, quoique elles sont également basses, les tarses des *Thinocorides* sont nus, les doigts plus longs. Il est aussi a remarquer que la proportion de la grandeur de l'œuf à celle de la taille de l'oiseau même est plus naturelle que celle dans les Echassiers des familles citées.

De ce qu'on sait des habitudes des *Thinocorides* et de ce que M. Jelski m'a communiqué il n'y a rien pour appuyer l'opinion de M. des Murs. Ils sont des oiseaux pulvérateurs, se tiennent en compagnies, et en temps de la nidification ils se séparent en paires; ils prennent le vol en criant comme les Gangas; comme ces derniers ils sont doués d'un vol rapide, élevé, et peuvent enteprendre de longs voyages. Leur gésier est musculeux, el ils se nourissent principalement de matières végétales comme feuilles et extrémités de tigès de différentes herbes, parmi lesquelles on trouve du sable et de petits cailloux.

Comme les *Pteroclides* habitent les déserts et les plateaux arides de l'ancien continent, les *Thinocorides* se tiennent dans l'Amérique méridionale sur les hauts plateaux stériles et les pâturages maigres de la chaîne des Cordillères, depuis la Patagonie jusqu'au Pérou central. Il est donc plus naturel de considérer cette dernière famille comme remplaçant et représentant dans des localités pareilles du nouveau monde la famille des *Pteroclides*, propre à l'ancien continent, au lieu de les placer d'après des caractères exceptionnels et insuffisants dans une position qui ne sera jamais naturelle et suffisamment approuvée.

2. THINOCORUS RUMICIVORUS, Esch. Zool. Atl. t. 2.

Th. eschscholtzii, Geoff. et Less.

Plusieurs exemplaires des environs de Lima et de Chorillos.

3. ATTAGIS GAYI (Geoffr. et Less.).

Une paire de la montagne Ninarupa aux environs de Junin.

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* *Loc. cit.* p. 351.

Family [illegible].

1. [illegible], Tsch. Consp. Av. n. 271; Fn. Peru. Orn. p. [illegible].

Une paire de Monterico.

2. [illegible], Tsch. Fn. Peru. Orn. p. 281, t. [illegible].

Un mâle adulte et un jeune recueillis le 8 Avril, 1872, entre Chilpes et St. Bartolomé.

Family CRACIDÆ.

1. [illegible] (L.). Temm. P. C. 103; Tsch. Fn. Peru. Orn. p. [illegible].

[illegible], Scl. et Salv. P. Z. S. 1873, p. 307.

Plusieurs exemplaires de Monterico et d'Amable-Maria.

2. PENELOPE BOLIVIANA, Reich.; Scl. et Salv. P. Z. S. 1873, p. 307.

Penelope [illegible], Tsch. Fn. Peru. Orn. p. 48?

Plusieurs exemplaires de Monterico et d'Amable-Maria.

3. PENELOPE SCLATERI, Gr.

Un mâle de Chilpes.

4. ABURRIA CARUNCULATA, Reich.

Penelope [illegible], Tsch. Fn. Peru. Orn. p. 48.

Une paire [illegible] d'Amable-Maria et de Ropaybamba.

5. CHAMÆPETES [illegible], Less.

Penelope [illegible], Tsch. Fn. Peru. Orn. p. 291, t. 31.

Trois exemplaires d'Auquimarca et de Chilpes.

6. PIPILE CUMANENSIS (Jacq.); Scl. et Salv. P. Z. S. 1873, p. [illegible].

Penelope pipile, Tsch. Fn. Peru. Orn. p. 48.

Plusieurs exemplaires de Monterico.

7. ODONTOPHORUS [illegible], Spix, Av. Bras. t. 73.

Une paire de Monterico. « Manakaraku » des habitants de la [illegible].

Family RALLIDÆ.

1. ARAMIDES CAYENNENSIS (Gm.).

[illegible], Spix, Av. Bras. t. [illegible]; Scl. et Salv. P. Z. S. [illegible], p. [illegible].

Un exemplaire d'Amable-Maria.

2. **Rallus rythirhynchus** (Vieill.); Gr. H.-list B. Brit. Mus. 1871, iii. p. 59.

Rallus cæsius, Tsch. Fn. Peru. Orn. p. 300.

Plusieurs exemplaires de Junin et de Lima.

3. **Porzana viridis** (Müll.); Gr. H.-list B. Brit. Mus. 1871, iii. p. 60.

Rallus cayennensis, Gm. L. S. N. xiii. 1. p. 718. n. 27.

Gallinula pileata, Wied. Beit. iv. p. 802; Tsch. Fn. Peru. Orn. pp. 62 et 302.

Porzana cayennensis, Scl. et Salv. Nomencl. p. 139.

Plusieurs exemplaires d'Amable-Maria.

4. **Gallinula galeata** (Licht.); Tsch. Fn. Peru. Orn. pp. 52 et 302.

Des oiseaux adultes, des jeunes et des œufs des environs de Chorillos et de Junin.

5. **Fulica gigantea**, Eyd. et Soul. Voy. Bonite, t. 8; Tsch. Fn. Peru. Orn. p, 302.

Trois exemplaires adultes et des poussins de Junin.

6. **Fulica ardesiaca**, Tsch. Wiegm. Arch. 1873, i. p. 389. 17; *id.* Faun. Peru. Orn. p. 303.

Des oiseaux jeunes et des œufs de Junin, un jeune oiseau en mue de Chorillos.

Family CHARADRIIDÆ.

1. **Charadrius virginicus**, Bork.; Tsch. Fn. Peru. Orn. pp. 49 et 296; Salv. et Scl. P. Z. S. 1874, p. 309.

Une femelle de Chorillos.

2. **Ægialitis nivosa**, Baird, Birds N. Amer. p. 696.

Plusieurs individus en différents plumages des environs de Chorillos.

On n'a pas raison de confondre cet oiseau avec l'espèce européenne *Æ. cantiana* (Lath.). L'espèce américaine est plus petite et diffère en plusieurs détails de coloration, c'est à dire : la couleur du dessus de la tête et du manteau est plus claire et variée de bordures pâles dans toutes les plumes, tandis que la couleur de ces parties est presque uniforme dans l'oiseau d'Europe ; le dessus de la tête est presque de même couleur que le dos, tandis qu'il est plus ou moins teint de roussâtre dans l'oiseau cité ; l'oiseau américain n'a point de trace de trait noir devant l'œil, qui dans l'*Æ. cantiana* est même représenté par un trait gris en plumage d'hiver ; la bande sourcilière blanche est plus large, se trouve également développée en habit d'hiver et dans des jeunes en premier plumage, tandis que dans l'espèce européenne elle est moins large et plus ou moins enduite de roussâtre en hiver. Le bec de l'oiseau d'Amérique est un peu plus fort. Dimensions:

	♂ en noce.	♂ en habit d'hiver.
Longueur de l'aile pliée	100	100
„ du tarse	25	25
„ du bec depuis la commissure	17	18
„ du doigt median avec l'ongle.	19	20

3. **Ægialitis semipalmata** (Bp.).

Charadrius brevirostris, Wied.; Tsch. Fn. Peru. Orn. pp. 49 et 296.

Une femelle de Chorillos (Laguna Vitta).

4. **Vanellus resplendens** (Tsch.): Fn. Peru. Orn. p. 295.

Nombreux exemplaires de Junin et de Maraynioc.

5. **Oreophilus ruficollis** (Wagl.).

Une paire de Junin.

6. **Calidris arenaria** (L.).

Plusieurs exemplaires de Chorillos.

7. **Strepsilas interpres**, L.

Strepsilas collaris, Tsch. Fn. Peru. Orn. p. 49.

Plusieurs exemplaires de Chorillos.

Family Scolopacidæ.

1. **Totanus melanoleucos** (Gm.); Tsch. Fn. Peru. Orn. p. 52.

Plusieurs exemplaires en différents plumages de Chorillos et du lac Junin.

2. **Totanus flavipes** (L.); Tsch. Fn. Peru. Orn. p. 51.

Gambetta flavipes, Scl. et Salv. P. Z. S. 1873, p. 310.

Plusieurs exemplaires de Chorillos et du lac Junin.

3. **Totanus chloropygius**, Vieill.; Tsch. Fn. Peru. Orn. p. 51.

Totanus solitarius (Wils.); Scl. et Salv. P. Z. S. 1873, p. 309.

Un exemplaire de Chorillos.

4. **Actiturus bartramius** (Wils.); Scl. et Salv. P. Z. S. 1873, p. 309.

Une paire de Chorillos.

5. **Tringa maculata**, Vieill.; Tsch. Fn. Peru. Orn. p. 51; Scl. et Salv. P. Z. S. 1873, p. 309.

Plusieurs exemplaires des environs de Chorillos et du lac Junin.

6. **Tringa bonapartii**, Schl.

Une paire de Laguna Villa près de Chorillos.

7. Tringa minutilla, Vieill. Nouv. Dict. xxxiv. p. 466.

Tringa fuscicollis, Tsch. Fn. Peru. Orn. p. 51.

Une paire de Laguna Villa près de Chorillos.

8. Hemipalama himantopus, Bp.

Micropalama himantopus, Scl. et Salv. P. Z. S. 1873, p. 309.

Trois exemplaires de Chorillos.

9. Gallinago andina, sp. nov.

Similis G. frenatæ *sed minor, rostro breviore et graciliore, remigibus tertiariis primarios externos æquantibus; maculis dorsi alarumque subtilioribus et numerosioribus, fulvo-rufescentibus; gula, pectore lateribusque fulvis fusco variis; abdomine medio late candido, subcaudalibus albis. Pedes et rostrum basi flavicantes; iris fusco-brunnea.*

Elle est plus petite que la *G. frenata* de Cayenne, à bec plus court et considérablement plus mince, à pattes plus basses et plus faibles; la partie nue au-dessus du talon très-basse. Les ailes sont également amples, mais les tertiaires atteignent l'extrémité des primaires externes, tandis que dans la *G. frenata* elles égalent la 4^e ou la 5^e.

En coloration cette bécassine diffère principalement par la tacheture des parties supérieures, composée de taches beaucoup plus nombreuses, plus petites, plus variées et d'une teinte plus roussâtre. Le fond de la gorge, du devant de la poitrine et des côtés du corps est fauve, tandis qu'il est d'un gris roussâtre sale dans l'espèce citée. Les subalaires sont blanches à maculature plus fine, celles du rang postérieur sont barrées de blanc tandis que dans la *G. frenata* elles n'ont que l'extrémité blanche. Les bandes foncées des axillaires sont presque de moitié plus minces que les bandes blanches, et dans la *G. frenata* elles sont presque de même largeur. Les barres foncées des rectrices externes sont plus minces, le fond est d'un blanc plus pur; les subcaudales sont blanches tandis que dans la *G. frenata* elles sont d'une couleur sale.

Les pattes sont plus claires, d'une couleur jaunâtre, dont on ne peut pas reconnaitre la nuance en état desséché.

Dimensions comparatives des deux espèces:

	Gallinago andina.			*G. frenata.*	
	♂	♀	♂ juv.	♂	♀
Longueur de l'aile pliée	115	115	108	122	118
„ du bec depuis la commissure ..	60	50	53	68	65
„ du tarse	27	28	28	35	34
„ du doigt médian avec l'ongle ..	32	30	30	35	36

Trois paires recueillis aux environs du lac Junin dans le Haut Pérou central.

10. Phegornis mitchelli (Fras.).

Une paire de Junin.

Family IBIDIDÆ.

1. **THERISTICUS MELANOPIS** (Gm.); Bp. Consp. Av. ii. p. 155; Tsch. Fn. Peru. Orn. p. 51 et 298.

Trois exemplaires de Junin.

2. **FALCINELLUS ORDI**, Bp.; Tsch. Fn. Peru. Orn. pp. 51 et 298.

Nombreux individus en différents plumages et des œufs de Junin.

Family PHŒNICOPTERIDÆ.

PHŒNICOPTERUS IGNIPALLIATUS (Geoff.); Tsch. Fn. Peru. p. 304.

Deux paires de Junin.

Family LARIDÆ.

1. **LARUS VERREAUXII**, Bp. Consp. Av. ii. p. 221.

Dominicanus verreauxii, Bruch, Cab. J. f. O. 1855, p. 281. sp. 16.

Plusieurs exemplaires adultes et jeunes de Chorillos.

2. **LARUS FRANKLINI**, Sw. Faun. Am.-Bor. t. 71.

Plusieurs exemplaires de Chorillos.

3. **LARUS SERRANUS**, Tsch. Fn. Peru. Orn. p. 307.

Plusieurs exemplaires en noce, en habit d'hiver et des œufs de Junin.

4. **LARUS BELCHERI**, Vig.; Bruch, Cab. J. f. O. t. 3. f. 58.

Plusieurs exemplaires en noce, en habit d'hiver et des jeunes de Chorillos.

5. **NÆNIA INCA** (Less.).

Une paire de Chorillos.

6. **RHYNCHOPS MELANURA**, Boié?

Plusieurs individus tués dans le commencement de Mars aux environs de Chorillos.

Ces oiseaux diffèrent tellement de *R. nigra*, qu'il est impossible de les confondre. La longueur de l'aile présente la plus grande différence, celle de l'espèce péruvienne excède l'aile de la *R. nigra* de 60 millim. Le bec est beaucoup plus grand et plus fort. La coloration présente aussi plusieurs différences; la principale consiste dans le manque complet de miroir blanc à l'aile, qui dans l'oiseau de l'Amérique septentrionale occupe la moitié terminale des remiges secondaires. Il manque aussi à notre oiseau de demi-collier blanc au cou, qui est seulement indiqué par une couleur un peu plus pâle que les parties environnantes. Les subalaires ne sont pas blanches mais d'un gris brunâtre; le front, les côtés du visage et le devant de la gorge sont plus ou moins nuancés de gris. Toute la queue est brun noirâtre à rectrices bordées d'un liséré clair.

M. Jelski a indiqué sur les étiquettes que la prunelle n'est pas ronde mais en ligne verticale comme dans le chat. Dimensions d'un mâle :

	millim.
Longueur de l'aile pliée	415
„ de la queue	136
„ du bec depuis la commissure	135
„ de la mandibule supérieure	105
„ du tarse	35
„ du doigt médian avec l'ongle	30

Family Procellariidæ.

Nectris chilensis, Bp. Consp. Av. ii. p. 202.

Une paire de Chorillos.

Family Podicipidæ.

1. **Podiceps leucotis**, Cuv. Voy. Uran. t. 36.
Podiceps rollandi, Q. et G.
Plusieurs exemplaires de Junin.

2. **Podiceps kalipareus**, Less. Voy. Coquille, t. 45; Tsch. Fn. Peru. Orn. p. 56.
Plusieurs exemplaires de Junin.

Family Tinamidæ.

1. **Tinamus major** (Gm.); Buff. Pl. Enl. 476.
Une femelle de Monterico.

2. **Tinamus kleei**, Tsch. Fn. Peru. p. 284, t. 32.
Une femelle de Monterico.

3. **Crypturus obsoletus** (Temm.).
Une paire de Monterico.

4. **Nothoprocta branickii**, sp. nov.

Supra griseo nigro fulvoque varia; pileo nuchaque nigris fulvo maculatis, gula colloque fulvis maculis nigris adspersis, pectore cinereo, abdomine fulvo-rufescente, lateribus cinerascentibus fulvo vermiculatis; remigum griseo-fuscorum pogonia externa rufo fasciata. Rostri corneo-nigricantis mandibula inferior basi pallida; pedes flavidi; iris fusco-brunnea. Long. tota 290, *alæ* 170, *tarsi* 38, *rostri a commissura* 31 *millim.*

Un mâle tué aux environs de Junin le 16 Mai, 1873. Le mode de coloration de cette espèce ressemble en général à celui des autres *Nothoproctæ*, mais il s'en distingue par plusieurs particularités. Le fond du sommet de la tête et de la nuque est brun noirâtre tacheté de fauve, ces taches sont petites mais nombreuses au front, et forment des bandes transversales en arrière. La gorge et le cou sont fauves maculés de taches noires, plus rares et formant des stries

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[illegible]	[illegible]	[illegible]	[illegible]

Brought forward ...	347
Cypselidæ	1
Caprimulgidæ	6
Picidæ	13
Alcedinidæ	2
Momotidæ	1
Trogonidæ	3
Galbulidæ	2
Bucconidæ	3
Cuculidæ	2
Ramphastidæ	6
Capitonidæ	3
Psittacidæ	8
Falconidæ	14
Strigidæ	3
Pelecanidæ	5
Carried forward......	419

Brought forward ...	419
Anatidæ	8
Ardeidæ	2
Columbidæ	12
Thinocoridæ	3
Perdicidæ	2
Cracidæ	7
Rallidæ	6
Charadriidæ	7
Scolopacidæ	10
Ibididæ	2
Phœnicopteridæ	1
Laridæ	6
Procellariidæ	1
Podicipidæ	2
Tinamidæ	2
Total	490

2. Descriptions of New Asiatic Lepidoptera.

By Frederic Moore, India Museum, London.

[Received July 9, 1874.]

(Plates LXVI. & LXVII.)

PAPILIONES.

Fam. NYMPHALIDÆ.

Subfam. SATYRINÆ.

HIPPARCHIA CADESIA, n. sp. (Plate LXVI. fig. 7.)

Allied to *H. hübneri*, Feld.

Male. Upperside bright ferruginous; exterior marginal line blackish; cilia yellowish alternated with brown: fore wing with the base, costal, and exterior border pale brown; a subapical pale-bordered black spot with a white central dot; subcostal vein and its branches blackish, terminating in a transverse sinuous submarginal line: hind wing with the base, abdominal and outer border brown, the veins being ferruginous; a submarginal series of blackish lunules.

Underside: fore wing paler ferruginous, the costal and outer borders being fawn-colour; a few transverse brown strigæ within the cell; veins below the apex terminating in a pale streak: hind wing ferruginous white, numerously covered with short blackish strigæ, which are thickest at the base; veins prominently whitish; a broad curved transverse median brown band with irregular black borders, and a broad submarginal brown band with black outer dentate lunules; outer margin and base of wing suffused with brown. Body and legs brown. Antennæ yellow, tip ferruginous.

Exp. 1$\frac{7}{12}$ inch.

Hab. Cashmere: Boorzil valley towards Stakpila Pass, 11000 ft. (*Capt. H. B. Hellard, R.A.*).

EPINEPHELE PULCHELLA, Felder, Nov. Voy. Lep. p. 490, tab. lxix. fig. 16.

Upperside vinous brown; middle of fore wing in male dusky ferruginous, bright ferruginous in the female, enclosing a black subapical spot.

Underside greyish brown: fore wing bright ferruginous in both sexes: ocellus with a white dot: hind wing with narrow short dark brown strigæ, and crossed by a subbasal, discal, and submarginal row of dusky dentate lunules.

Exp. 1⅜ inch.

Hab. Cashmere (*Capt. H. B. Hellard*).

Differs from *E. neoza*, Lang, in being smaller, in the ferruginous on the fore wing being more distinct in the male, and in the absence of the transverse discal sinuous brown line on the fore wing.

MYCALESIS KHASIANA.

Male. Upperside dark vinous brown, paler at the apex and along exterior border; marginal lines black. Underside bright vinous brown, purplish grey along exterior border; covered with minute black and grey strigæ: both wings with a transverse discal narrow purplish grey band, and a distinct yellow narrow marginal black-bordered band: fore wing with five and hind wing with seven minute perfect ocelli.

Exp. 1⅞ inch.

Hab. Khasia Hills (*Major Godwin-Austen*).

MYCALESIS CHARAKA.

Male and *female*. Upperside yellowish olive-brown, outer margins paler: fore wing with two very prominent bright-coloured ocelli, the upper one the smallest and sometimes with two white pupils, the lower ocellus fully a quarter of an inch in diameter.

Underside pale olive-brown basally, greyish brown externally, divided by a nearly straight transverse discal brown line; two subbasal short zigzag brown lines on fore wing and one on hind wing; both wings with a narrow black submarginal line, and a brown fascia or cloud passing through the ocelli: fore wing with a linear series of four minute subapical ocelli, and a small though larger lower ocellus, the white pupil of which is a half-circle and occupies nearly the whole of the black portion: hind wing with seven ocelli, the first three subapical, minute, and disposed in a linear oblique series, fourth very minute, fifth the largest (though small), sixth and seventh minute.

Exp. 1⅝ inch.

Hab. N.E. Bengal. In Brit. Mus. and Coll. F. Moore.

This species is very similar in appearance to *M. gotama*, but may be distinguished by the very considerable difference in the size of the ocelli beneath.

Note.—The specimens of this species in the British-Museum collection stand as the representatives of Hübner's *M. otrea* (Zuträge, f. 79, 80), which name Professor Westwood altered, in the 'Genera of Diurnal Lepidoptera' (p. 394) to *ostrea*, believing Hübner's figure to represent a species distinct from Cramer's *otrea*; but I find, after a careful examination of a lengthened series of specimens in the British Museum and others in my own collection, that Hübner's figure well represents a *male* of Cramer's species (*otrea*), whose figure (pl. 314. f. A, B) is that of a female. The name *ostrea*, therefore, cannot be retained, as it was applied to Hübner's figure, and *not* to the specimens which Prof. Westwood erroneously determined as representing it.

YPHTHIMA NEWARA.

Yphthima nareda, Hewits. Trans. Ent. Soc. 1865, pl. 17. fig. 7 (*nec* fig. 6).

Male. Upperside brown: fore wing with single subapical ocellus; hind wing with two subanal ocelli, the former bipupilled, and the latter with a single pupil of bright blue.

Underside yellowish grey, partly covered with numerous short brown strigæ; both wings with a narrow submarginal brown fascia: fore wing with single bipupilled ocellus as above: hind wing with three ocelli, the apical one very large, the anal bipupilled, the others with single bright blue pupil.

Female brown, externally with short pale strigæ; both wings with single ocellus above. Underside as in male.

Exp. 1⅝ inch.

Hab. Nepal. In Coll. W. C. Hewitson and F. Moore.

Differs from *Y. nareda*, Kollar, in being somewhat larger, the female striated above, the ocelli of both sexes much larger on the underside, and the position of the ocellus on fore wing being less inwardly oblique.

YPHTHIMA NIKÆA.

Upperside dark brown: pupils of ocelli blue: fore wing with a subapical bipupilled ocellus (smaller than in *Y. sakra*): hind wing with two subanal ocelli; male sometimes with only one subanal ocellus.

Underside grey, with numerous short brown narrow strigæ: fore wing with ocellus as above, and a distinct brown submarginal transverse fascia: hind wing with five ocelli, the two apical being the largest and joined together, though having a yellow band between them; the other three ocelli in a linear series from anal angle, the anal one bipupilled.

Exp. $1\frac{7}{10}$ inch.

Hab. N.W. Himalayas. In Coll. Capt. A. M. Lang and F. Moore.

Differs from *Y. sakra* in its smaller size, darker colour above and greyer below; and may be distinguished by the difference of the apical ocelli on the hind wing, which in *Y. sakra* have no intervening yellow band.

YPHTHIMA AVANTA.

Upperside dark brown, with an indistinct bipupilled ocellus on the fore wing, and two subanal ocelli on hind wing.

[illegible] being [illegible] with [illegible] silver-pupilled ocelli, [illegible]

Exp. [illegible]

Hab. [illegible] (Capt. H. B. Hellard).

[illegible]

Male. [illegible] fore wing with a [illegible] hind wing with a small [illegible]

[illegible] hind wing with [illegible] from anal angle.

Exp. [illegible]

Hab. [illegible] and F. Moore.

This species is similar in appearance to *Y.* [illegible]; the ocelli of the [illegible] are smaller, the ground-colour of the underside being [illegible], and without transverse [illegible].

Subfam. Elymninæ.

Elymnias singhala.

Female. Upperside dark [illegible] fuliginous brown: fore wing with pale yellow-speckled [illegible] patches on exterior margin: hind wing with a [illegible] series of narrow and broad partly confluent pale yellow streaks, some small streaks also along the exterior margin: cilia whitish. Underside dark brown, palest exteriorly, apex of fore and hind wings suffused with pale pink: both wings covered with numerous short transverse black confluent strigæ, which are broadest and darkest at the base of fore wing and along exterior margin of hind wing: hind wing with a submarginal series of six black dots each on a pale pinkish space, the upper spot having a small contiguous pure white spot.

Exp. 3 inches.

Hab. Colombo, Ceylon (*Capt. F. J. Hutchison*).

Subfam. Nymphalinæ.

Argynnis vitatha.

Allied to *A. aglaia*; markings similar but more prominent. Underside of hind wing with the whole of the space from base to the transverse discal series of silvery spots, as well as their outer bordered spots, and marginal lunules, dark powdery green.

Exp. 2¼ inches.

Hab. Cashmere, N. side of Rajdiangan Pass and Gurais (*Capt. H. B. Hellard*).

Argynnis sipora. (Plate LXVI. fig. 11.)

Allied to *A. pales.*

Upperside pale fulvous in the male, dusky fulvous in the female.

Male—fore wing with black narrow short streak, two small spots, and a recurved streak within the cell, a curved streak at its end, a dentate spot beneath and an irregular transverse discal series of lunules beyond the cell; a transverse discal row of conical spots, a submarginal row of triangular spots, and a marginal line formed into less-defined spots, one being at the end of each vein: hind wing with two narrow streaks at end of the cell, a transverse discal series beyond, two outer and a marginal row of spots. *Female*—black markings broader, the submarginal row of spots on both wings large and with pale whitish outer marginal border: cilia white.

Underside, *Male*—fore wing paler, markings indistinct, apex and exterior border yellow, streaked with red: hind wing yellow, abdominal margin greenish; a broad irregular subbasal and discal transverse red band, the basal band enclosing a pearly-white round spot within the cell and an elongated spot beneath it, the band bordered exteriorly by three pearly-white transverse streaks; within the discal band the upper and lower portions are slightly streaked with pearly white, and on the middle portion is a series of five blackish spots; on the outer margin of the wing is a row of quadrate pearly-white spots. *Female*—fore wing dark fulvous; markings more prominent, apex and margin greenish: hind wing with the base and middle portion dark green, the subbasal and discal bands dark chestnut-red; markings as in male.

Exp. ♂ $1\frac{3}{8}$, ♀ $1\frac{4}{8}$ inch.

Hab. Cashmere, near Gungabul lake, at foot of Haramook Peak (*Capt. H. B. Hellard*).

SYMBRENTHIA COTANDA. (Plate LXVI. fig. 9.)

Male. Allied to *S. hypselis* (figured by Boisduval and Doubleday), but is smaller; bands orange-red, very broad; the band from base of fore wing with irregular sinuous margins and confluent with cloudy red patches below the cell; narrow marginal line on hind wing distinct and extending to near anterior angle. Underside white, clouded with dark yellow; tessellations similar; submarginal series of metallic-green conical spots and caudal lunules prominent.

Female differs from male only in having paler bands, and in the oblique subapical spot being irregularly lengthened and extending from the costa to near edge of exterior margin, above which is a small recurved streak.

Exp. ♂ $1\frac{7}{8}$, ♀ 2 inches.

Hab. Darjeeling (*A. E. Russell*). In Coll. F. Moore.

SYMBRENTHIA KHASIANA.

Male and *female*. Allied to *S. hyppocla*, but differs from N.W. Himalayan specimens on the upperside in having the orange-red bands somewhat narrower, and in the submarginal band on the hind wing being dotted with black. On the underside the interlacings and other markings are prominent.

Exp. ♂ $1\frac{6}{8}$, ♀ $2\frac{1}{8}$ inches.

Hab. Khasia hills (*Major Godwin-Austen*).

SYMBRENTHIA DARUKA. (Plate LXVI. fig. 10.)

Male. Allied to *S. hyppocla*; differs on the upperside in having the orange-red bands very broad, which are irregular-margined and confluent, leaving but little black intervening spaces. On the underside the colour is paler and the interlacings much less prominently defined.

Exp. 1$\frac{6}{8}$ inch.

Hab. N. India. In Coll. F. Moore.

NEPTIS EURYNOME.

Limenitis eurynome, Westwood, in 2nd edit. Donov. Ins. of China, p. 66.

Pap. leucothoë, Donovan, Ins. of China, 1st edit. t. 35. f. 3 (1798), *nec* Cram.

Male and *female*. Upperside fuliginous, black; markings white and very broad, broader than in *N. leucothoë*, Cram., or in *N. surakarta*; submarginal row of spots on fore wing prominent; outer band of hind wing very broad, nearly the same width as inner band. Underside ferruginous yellow; bands as above, all black-bordered; subbasal streak on hind wing short and not black-bordered.

Exp. ♂ 2$\frac{3}{8}$, ♀ 2$\frac{5}{8}$ inches.

Hab. N. China (Shanghai).

Differs from *N. leucothoë*, Cram., in its larger size, broader markings, and much greater width of the outer band on hind wing.

NEPTIS KAMARUPA.

Male and *female*. Upperside fuliginous black; markings white, broad, prominent: fore wing with the discal series of spots at very oblique angles, the first spot of the lower portion small; a prominent marginal linear series of white quadrate spots: hind wing with the subbasal band evenly margined; outer band broad and composed of quadrate spots; a prominent narrow white marginal line. Underside ferruginous yellow; markings as above; very slightly black-bordered.

Exp. ♂ 2$\frac{1}{8}$, ♀ 2$\frac{2}{8}$ inches.

Hab. Assam. In Coll. Oxford University Museum.

Nearest allied to *N. varmona*, but may be distinguished from it on the underside by the delicate narrow black bordering of the bands and the absence of the black streaks on the veins of the fore wing.

NEPTIS PAPAJA.

Male. Upperside fuliginous black; markings white, disposed somewhat as in *N. emodes*: fore wing with the discoidal streak and terminal elongated triangular spot blackish-speckled; transverse discal series of spots small, each widely separated; the row of submarginal lunular spots bordered on each side by pale-bordered black lunules: hind wing with straight subbasal band and submarginal row of separated lunules; a line between the bands and outer marginal line pale brown. Underside ferruginous yellow; markings prominent, black-bordered; two marginal lunular lines on hind wing.

Exp. 1⅞ inch.

Hab. Sumatra (*Wallace*). In Coll. Oxford University Museum and F. Moore.

NEPTIS HARITA. (Plate LXVI. fig. 8.)

Male and *female*. Upperside olive-brown: fore wing with paler and rather indistinct discoidal streak and dentate discocellular mark; two transverse discal series of pale black-bordered zigzag lunules, and a submarginal similar lunular line: hind wing with pale narrow subbasal transverse band, with dark outer border, beyond which is a blackish fascia, and then a submarginal row of pale-bordered dark lunules (these lunules being triangular in the female). Underside olive-brown; markings as above, but whiter.

Exp. 2 inches.

Hab. E. Bengal. In Coll. F. Moore.

Allied to *N. vikasi*, but may be distinguished from it by its smaller size, less-distinct markings, and in the submarginal band of the hind wing being formed of distinct lunules.

NEPTIS OMERODA.

Upperside blackish, glossed with greenish olive-brown; banded with olive-brown, as in *N. vikasi*; the upper portion of transverse discal series of spots on the fore wing oval, lower portion rounded. Underside black, palest externally, with a glaucous gloss; veins brown; discoidal streak, lower portion of transverse discal series of spots of fore wing, and inner band of hind wing pale fuliginous; the subapical spots and outer bands greyish white, the scales on the latter being raised or depressed and thus having the appearance of short strigæ.

Exp. 1⅜ inch.

Hab. Penang. In Coll. Oxford University Museum.

Allied to *N. vikasi*, but is a much blacker insect both above and below.

Fam. LYCÆNIDÆ.

CHRYSOPHANUS ADITYA. (Plate LXVI. fig. 1.)

Allied to *C. hippothoë*.

Male. Upperside brilliant metallic brassy copper-red: cilia black, edged with white: fore wing with a narrow jet-black costal edge and outer marginal band, the band expanded at the apex and maculate between the veins: hind wing with a marginal jet-black line and prominent conical spots; abdominal margin greyish.

Underside: fore wing pale golden yellow, brightest on the disk; two pale-bordered black spots within and a larger spot crossing end of the cell; a curved series of four black spots from the costa before the apex, a submarginal series of black dentate lunules, and a marginal row of small black spots: hind wing dull greyish white; two black spots above, two below, two within, and a geminated spot at end of the cell; a transverse interrupted discal series of nine black spots, a submarginal row of black dentate lunules bordered outwardly with golden yellow, and a marginal row of small spots.

Exp. 1⅜ inch.

Hab. Dras valley (between Tashgam and Korkitchoor), Ladak (*Capt. H. B. Hellard*).

Gen. nov. NIPHANDA.

Palpi very long, porrect, extending much beyond the head, flattened; second joint fusiform, squamose; third joint slender, naked, slightly thickened vertically at the tip. Antennæ (broken). Body robust. Legs slender, minutely squamose. Wings broad, strong: fore wing elongated, trigonal, costa arched; hind margin extending much beyond posterior wing; exterior margin slightly convex towards posterior angle, which is acute; median vein with four branches, the second and fourth arising at the extremity of the cell, the third starting from the second near its extremity before the apex: hind wing arched along anterior margin; outer angle much rounded, abdominal margin long and nearly straight, anal angle acute.

Near to *Chrysophanus*.

NIPHANDA TESSELLATA. (Plate LXVI. fig. 6.)

Upperside pale glossy blue: cilia white, streaked with brown: fore wing with a broad dusky black band along the costa and exterior margin; a patch below the apex, a discocellular spot, and a lower discal spot also black; a short white streak at posterior angle: hind wing broadly dusky black along anterior margin; the exterior margin with a series of black spots bordered with bluish white and an inner dusky line.

Underside white: fore wing with an irregular basal patch, a quadrate discocellular spot, and an interrupted transverse discal series of quadrate spots dark blackish brown; a suffused streak along the costa, a streak bordering the upper portion of discal spots, and a series of spots with inner bordered line on exterior margin pale brown, the penultimate posterior spot being large, prominent, and nearly black: hind wing with irregular pale-bordered basal marks, a contiguous transverse series of four quadrate spots, two spots beyond on middle of anterior margin, and a series of spots on exterior margin blackish brown, the basal and anal spots being most prominent; the basal interspaces, irregular streaks from abdominal margin, and lunules to exterior spots pale brown.

Exp. 1¼ inch.

Hab. Penang. In Coll. Lieut. H. Roberts, R.A.

POLYOMMATUS VARDHANA. (Plate LXVI. fig. 5.)

Male and *female*. Upperside greyish blue, with a pinkish gloss; veins exteriorly and marginal line black; a narrow black discocellular streak very prominent on fore wing; a broad band of dark bluish purple along anterior and exterior margins of fore wing and anterior margin of hind wing: cilia white alternating with black, on fore wing.

Female with the disk of fore wing pale bluish white, and indistinct dusky spots on margin of hind wing.

Underside bluish white: fore wing with a prominent black discocellular streak and a curved discal series of spots, the upper spots small and disposed obliquely before the apex, the three lower spots large: hind wing slightly powdered with blue at the base; a discal series of black dots, a dot within the cell, and a more prominent spot near base of anterior margin; a small black lunule on anal margin.

Exp. ♂ $1\frac{4}{8}$, ♀ $1\frac{3}{8}$ inch.

Hab. Jako, valley of Rupin river, in Busahir (*Capt. H. B. Hellard*).

POLYOMMATUS OMPHISA. (Plate LXVI. fig. 2.)

Allied to *P. galathea*, Blanchard, Jacq. Voy.

Male. Upperside very dark purple, the base only suffused with blue.

Female. Glossy vinous purple, with indistinct dull orange marginal spots on both wings: cilia white, with brown inner line, on upperside of both wings.

Underside: fore wing pale greyish fawn-colour, disk suffused with fuliginous; a prominent discocellular white-bordered black streak and transverse discal row of six spots: hind wing metallic golden green, a distinct white discocellular spot and angular discal series of white spots.

Exp. ♂ $1\frac{3}{8}$, ♀ $1\frac{4}{8}$ inch.

Hab. Dras valley, Ladak (*Capt. H. B. Hellard*).

POLYOMMATUS DEVANICA. (Plate LXVI. fig. 4.)

Allied to *P. alexis*.

Male. Upperside dark purplish blue, basally dashed with clear blue; discocellular black spot of underside visible above; cilia white alternating with brown.

Underside pale fawn-colour: fore wing with a white-bordered prominent black discocellular spot and a transverse discal row of five spots; a marginal row of white rings with dark centres, the space between which and the discal spots clouded with black: hind wing with four prominent white-bordered black subbasal spots and a discal series of seven spots, the five lower spots being disposed in a straight row, the two upper spots proceeding at right angles to anterior margin; a marginal row of pale-bordered dark spots surmounted by a submarginal black lunular line, the lower marginal spots slightly bordered with orange and speckled with metallic green; a triangular discocellular white spot centred with a slight black dentate mark; space between discal and submarginal spots streaked with white.

Exp. ♂ $1\frac{1}{4}$, ♀ 1 inch.

Hab. Dras valley, Ladak (*Capt. H. B. Hellard*).

POLYOMMATUS JALOKA. (Plate LXVI. fig. 3.)

Male. Upperside shining greenish blue basally, outer margin bluish purple; both wings with a distinct black pale-bordered discocellular spot and a transverse discal row of pale bluish white spots. *Female* dark purplish brown, glossed with greenish blue; discocellular spot larger and very prominent, discal spots whiter; cilia white, with inner black line on fore wing and black dentate spots on hind wing.

Underside. *Male*: fore wing pale grey, with indistinct pale-bordered discocellular spot and a transverse discal row of blackish spots: hind wing white, the base powdered with metallic blue; a broad irregular discal pale brown band enclosing a discocellular and two upper white patches. *Female*: fore wing pale fawn-colour; spots prominent; a blackish streak outside the discal spots; irregular discal band on hind wing tinged with yellow.

Exp. 1 inch.

Hab. Rajdiangan Pass, Sursungar and Stakpila Passes, and Baitul, Cashmere (*Capt. H. B. Hellard*).

Polyommatus samudra. (Plate LXVII. fig. 2.)

Male. Upperside pale lavender-blue, exterior margins and end of veins of both wings and anterior border of hind wing slightly fuliginous; costal edge white; cilia white, slightly brown at end of veins; abdominal margin greyish white; antennæ black, ringed with white. Underside greyish white, slightly greenish at base of hind wings: fore wing with a discal transverse recurved row of black spots, each with a white border; a narrow white-bordered black streak at end of the cell, and a submarginal series of blackish lunules: hind wing with a series of eight small white-bordered black spots, two being near anterior margin towards the base, five on the disk, and one on abdominal margin; a pale-bordered short black streak at end and a dot within the cell; a submarginal series of narrow black lunules with inner white borders and a marginal row of small metallic silvery spots which are slightly bordered within with red.

Female differs above in having the wings anteriorly and the veins broadly fuliginous, and beneath in the partial absence of the discal series of spots on the hind wing.

Exp. ♂ 1⅛, ♀ 1⅜ inch.

Hab. Gol and Skardo, Baltistan (*Capt. H. B. Hellard*).

Lycæna ardates. (Plate LXVII. fig. 1.)

Male. Upperside bluish purple; exterior marginal line and a short tail on hind wing black; cilia greyish, with dark inner line.

Underside dark fawn-colour: fore wing with two pale-bordered brown spots within and one below the cell, an irregular discal series, and a submarginal row of dentate lunules: hind wing with an irregular subbasal and discal pale-bordered brown band, a submarginal row of dentate lunules and contiguous marginal spots, a prominent subanal round black spot speckled with metallic green scales.

Exp. 1 inch.

Hab. Parl and Pooneh, Cashmere (*Capt. H. B. Hellard*).

DIPSAS ICANA. (Plate LXVII. fig. 3.)

Male. Upperside dark brown: fore wing with the interior portion purplish green, metallic only in certain lights, and traversed by the dark brown veins: hind wing slightly sprinkled with metallic green scales.

Underside pale sap-brown: fore wing with a dark brown broad spot at end of the cell; a transverse discal band decreasing in width and terminating one third from the posterior angle, being bordered outwardly by a narrow pale line; a narrow paler brown submarginal fascia and outer border: hind wing with a dark brown broad median transverse band including a discocellular spot, the band pale-bordered on both sides and terminating above anal angle in a zigzag line; a paler brown lunular submarginal fascia and outer band; a black-bordered orange patch at anal angle containing two black spots joined by a blue streak.

Exp. 1$\frac{4}{10}$ inch.

Hab. N.W. Himalaya (*Dr. Bayne Reed*). In Coll. F. Moore and Netley-Hospital Museum.

Fam. PAPILIONIDÆ.

PAPILIO LIOMEDON.

Upperside fuliginous black: fore wing with a submarginal linear series of circular pale yellow spots, which decrease in size to the apex: hind wing with a rather broad pale yellow median transverse band, a submarginal series of four yellow lunules and a fifth orange-yellow lunule enclosing a black spot at anal angle; indentations of wing each with a narrow yellow lunule.

Underside fuliginous brown, greyish at the base; the submarginal series of spots and median band as above, the fore wing having four narrow greyish-white longitudinal lines within the cell: hind wing with the disk beyond the band dusky yellow; the outer margin of the wing and tail bordered with black; between each vein and touching the median band is a lengthened black spot, the central ones conical, the two upper quadrate, and the one at the anal margin broken, its lower part forming a round spot, each of these spots is crossed by a row of pale purple speckles; the yellow space at the anterior and anal angles tinged with orange.

Exp. 3$\frac{1}{4}$ inches.

Hab. Calicut, Malabar coast of S. India (*S. N. Ward*).

Allied to *P. demolion*, of which it is the South-Indian form, differing from that species in the linear series of spots on the fore wing being smaller and placed nearer the margin, the median band of the hind wing narrower and further from the base, with its outer margin beyond the cell.

Fam. HESPERIDÆ.

ISMENE MAHINTHA. (Plate LXVII. fig. 4.)

Upperside dark glossy olive-brown; base of fore wing and middle of the hind wing with abdominal margin densely clothed with long ferruginous hairs: fore wing in male with a small yellow discal spot and a black oblique square patch below the cell; female with two yellow obliquely disposed discal spots: cilia of fore wing yellowish, of hind wing ochrey red.

Underside dark bluish fawn-colour, spots on fore wing as above. Body clothed with yellowish ferruginous hairs.

Exp. 1¾ inch.

Hab. Burmah. In Coll. F. Moore.

PYRGUS DRAVIRA. (Plate LXVII. fig. 5.)

Allied to *P. marrubi.*

Female. Upperside dark greyish sap-brown, streaked with black between the veins. Cilia alternated with white: fore wing with a median triangular series of three diaphanous white spots, one being disposed at end of the cell and two on the disk; a geminated series of three smaller spots before the apex: hind wing with a prominent yellowish white spot at end of the cell, and two smaller spots below it.

Underside paler: fore wing with markings as above: hind wing with greyish white subbasal and discal spots, a streak from end of cell to outer margin, and band along abdominal margin.

Exp. 1⅜ inch.

Hab. Cashmere (*Capt. H. B. Hellard*).

PAMPHILA DIMILA.

Allied to *P. comma.*

Male and *female.* Upperside testaceous; exterior border broadly fuliginous brown; apex of fore wing brownish testaceous. Cilia whitish testaceous: fore wing with a series of small yellow apical spots; male with an oblique silvery-lined black streak below the cell: hind wing with a yellow spot within the cell, and a curved discal series of four quadrate spots.

Underside: fore wing pale testaceous; apical spots as above: hind wing with basal portion greenish brown; three prominent white subbasal spots disposed above, below, and at end of the cell; a curved discal series of six quadrate white spots.

Exp. ♂ 1⅜, ♀ 1⅜ inch.

Hab. Runang Pass, Busahir (S.E. side, about 13,000 ft.) (*Capt. H. B. Hellard*).

HESPERIA KARSANA. (Plate LXVII. fig. 6.)

Upperside pale olive-brown. Cilia pale fawn-colour. *Male*—fore wing with minute oblique subapical pale yellow spots. *Female* with the subapical spots more distinct, below which is a discal row of four somewhat quadrate spots, the third spot smallest.

Underside much paler, marked as above; space from abdominal margin to middle of wing pale brownish white.

Exp. 1⅛ inch.

Hab. Rawul Pindi, N. Punjab (*Capt. H. B. Hellard*).

SPHINGES.

PERGESA DOLICHOIDES, Felder, MS.

Female. Brownish fawn-colour. Fore wing with four oblique transverse, straight, brown lines, with pale, glossy, chalybeate inner borders; exterior border with a submarginal lunular line, with pale inner border; a brown discal spot between second and third lines, and an indistinct lunular line between third and fourth. Hind wing dark brown. Abdomen with a pale dorsal line.

Exp. 3½ inches.

Hab. Sikkim. In Coll. Capt. Lang and F. Moore.

BOMBYCES.

Fam. CHALCOSIIDÆ.

Gen. nov. ATOSSA.

Fore wing elongated, trigonate; costa somewhat straight; apex produced; exterior margin oblique and slightly convex; hind margin straight. Hind wing with the costa extending beyond fore wing, arched in middle; apex produced to a pointed angle in the male; exterior and anal margins convex. Antennæ short, minutely serrated in female. Body slender, short. Palpi short, slender, not extending beyond the head, pilose; proboscis moderate. Legs slender, short, squamous; hind tibiæ with four rather short spurs. Fore wing with four superior veins, the first arising from half the length of the cell, second before the end of the cell and having two short branches ascending from half its length, third starting from end of cell, fourth proceeding from one third the length of the third; a straight discoidal vein from near inward angle of the discocellular vein; three inferior veins, first and second contiguous at end of cell. Hind wing with two superior, a discoidal, and three inferior veins.

ATOSSA NELCINNA. (Plate LXVII. fig. 7.)

Male and *female.* Upperside greenish fuliginous; veins and a longitudinal streak in cell of fore wing black: fore wing with the interspaces between the veins from base to disk greenish yellowish white; a transverse discal row of yellowish-white lunules, and a marginal row of small spots: hind wing with yellowish-white spaces between the veins at the base, a discal transverse row of conical spots and a marginal row of quadrate spots, both series partly confluent at anal angle. Underside paler and more greenish-tinged, markings as above, but more confluent. Antennæ and head black; thorax and abdomen black above, yellow beneath; abdomen with narrow yellow dorsal edges and two lateral rows of black spots. Legs black.

Exp. ♂ 2¾, ♀ 3 inches.

Hab. Gurhwal, N.W. Himalaya. In Coll. Capt. A. M. Lang and F. Moore.

Note.—Has very much the outward appearance of a species of *Pieris.* According to Capt. Lang's "Notes," it is a day-flier, and found during July flying heavily amongst high horse-chestnut trees (*Pavia indica*), just as *P. eucharis* might about a mango-grove.

Epicopeia mencia. (Plate LXVII. fig. 8.)

Male. Dark fuliginous black; veins black: hind wing short, with a long broad spatulate tail; a series of five crimson lunules transversely from anal angle straight across to outer margin; three similar lunules on posterior margin. Two crimson spots on thorax. Abdomen with crimson bands and lateral stripes.

Exp. 3⅝ inches.

Hab. Shanghai, N. China. In Coll. F. Moore.

Note.—"Full-grown larva 2½ inches long, perfectly white, and profusely covered with fine white powder, which comes off from the body at the slightest touch of the hand, leaving the dark skin underneath. Found in October; changed to a pupa same month. Collects two or three leaves together, and forms a kind of envelope of the powder. Imago makes its appearance in June of following year." —*E. Holdsworth.*

Fam. Saturnidæ.

Antheræa confuci.

Male. Greenish buff colour: fore wing with the base of costal margin purple-grey, and two short subbasal pinkish transverse lines, and two outer submarginal, transverse, parallel, pinkish lines; a dusky fascia from costa to hind margin passing outside the ocellus; ocelli of both wings small, oval, grey within, outer ring pink internally and black externally; inner ring white and yellow; central spot minute, half diaphanous, and yellow: hind wing with fainter pinkish subbasal line and two submarginal lines.

Exp. 5¼ inches.

Hab. Hills in neighbourhood of Shanghai, N. China. In Coll. E. Holdsworth.

Allied to *A. pernyi*, from which it differs in colour and in the distinct double submarginal lines.

Noctues.

Fam. Noctuidæ.

Euplexia cuprea, n. sp.

Male and *female*. Upperside cupreous brown: fore wing with a broad transverse median black band enclosing a dull-coloured orbicular spot and a yellow-bordered pale brown reniform spot; some blackish pale-bordered transverse streaks at base of wing and across exterior margin; four small yellow dots on costal margin near the apex: hind wing fawn-colour at base; a pale wavy submarginal line from anal angle. Underside paler; fore wing with a pale yellowish streak enclosing a small blackish spot at end of the cell; costal spots near apex, and wavy submarginal line; a prominent black spot on middle of hind wing.

Exp. 1¼ inch.

Hab. Simla, N.W. Himalaya. In Coll. F. Moore.

EXPLANATION OF THE PLATES.

PLATE LXVI.

Fig. 1. *Chrysophanus aditya*, p. 571.
2. *Polyommatus omphisa*, p. 573.
3. —— *jaloka* ♂, p. 573.
4. —— *devanica*, p. 573.
5. —— *vardhana*, p. 572.
6. *Niphanda tessellata*, p. 572.
Fig. 7. *Hipparchia cadesia*, p. 565.
8. *Neptis harita*, p. 571.
9. *Symbrenthia cotanda*, p. 569.
10. —— *daruka*, p. 570.
11. *Argynnis sipora*, p. 568.

PLATE LXVII.

Fig. 1. *Lycæna ardates*, p. 574.
2. *Polyommatus samudra*, p. 574.
3. *Dipsas icana*, p. 575.
4. *Ismene mahintha*, p. 575.
Fig. 5. *Pyrgus dravira* ♀, p. 576.
6. *Hesperia karsana* ♂, p. 576.
7. *Atossa nelcinna*, p. 577.
8. *Epicopeia mencia*, p. 578.

3. Measurements of the Red Corpuscles of the Blood of *Hippopotamus amphibius*, *Otaria jubata*, and *Trichechus rosmarus*. By GEORGE GULLIVER, F.R.S.

[Received August 5, 1874.]

Having on the 22nd of July, 1874, procured some blood from the first two of these animals and quickly thereafter made many careful measurements of the red corpuscles, I beg leave to submit a summary of the results, together with those concerning *Trichechus*, to the Society. Through the kind and judicious care of Mr. Bartlett and his son, and the skilful management of the keepers, no difficulty whatever was experienced in making a small puncture in the ear of the Hippopotamus and in the foot of the *Otaria*, from which in each case a drop of pure blood flowed and was well collected, apparently without the animal being at all sensible of this very slight operation.

Hippopotamus amphibius, a female, reported to be twenty-one years of age.—The average diameter of the red corpuscles proved to be $\frac{1}{3429}$ of an English inch. This is very slightly smaller than the same corpuscles of human blood, and somewhat larger than those of the Rhinoceros or of any other Pachyderm in which I have examined them, except the two Elephants and the *Hyrax*. In the African Elephant Mandl discovered that the corpuscles are the largest known of Mammalia; and my observations soon afterwards proved that the Indian Elephant has also corpuscles of similar magnitude; and, as I discovered, they are of about the same size in *Myrmecophaga* and *Orycteropus* (Proc. Zool. Soc. Jan. 24, 1854, and Feb. 10, 1870). In these two Edentates the red corpuscles of the blood have a mean diameter of $\frac{1}{2769}$ of an inch, in the Rhinoceros $\frac{1}{3765}$, in *Hyrax* $\frac{1}{3308}$. The exceptionally large size of the red blood-corpuscles of such a small species as *Hyrax* would be alone sufficient to indicate that it is not a regular member of the order Pachydermata.

Otaria jubata, a female.—The mean diameter of the red blood-corpuscles proved to be $\frac{1}{3000}$ of an inch; while those of man measure, on the average, $\frac{1}{3200}$. Thus in *Otaria* these corpuscles are larger than those of any of the Carnivora recorded in my Tables appended to the Sydenham Society's edition of Hewson's works. In all my then measurements of the red corpuscles in this order those of *Phoca* proved the largest; and now this size is exceeded in *Otaria* and *Trichechus*. The smallest red blood-corpuscles in the Carnivora occur in some species of *Viverra*, *Paradoxurus*, and *Herpestes*. But between several sections of this order there are curious irregularities in the differences of the size of these corpuscles, which, as our knowledge extends, will probably prove of physiological significance: meanwhile I have already shown that they have taxonomic value; for example, by the comparative magnitude of the red blood-corpuscles alone the Canidæ may be easily distinguished from Viverridæ.

Trichechus rosmarus.—This animal (the Morse or Walrus of popular books) has the red blood-corpuscles still larger than those of the Eared Seal. Some years ago a young Walrus arrived in a sickly state, and died soon afterwards, at the Society's menagerie, when I examined its blood and found it very rich in red blood-corpuscles, and consequently of high specific gravity. Referring to my notes, it appears that the mean of numerous measurements of the diameter of the corpuscles was $\frac{1}{2769}$ of an inch, being exactly the same as the average diameter of the corresponding corpuscles of the two great Edentates already mentioned. And this conclusion is confirmed by recent measurements of the old specimens of the blood-corpuscles of *Trichechus*; they were so long since dried, and yet are still beautifully perfect. Thus of all apyrenæmatous red corpuscles, those of *Elephas*, *Myrmecophaga*, *Orycteropus*, and *Trichechus* are the largest at present known.

The red blood-corpuscles of man are among the largest of the Mammalia. No British animal of this class has them so large; in all my former observations red corpuscles distinctly larger than of man were found only in six Mammalia, to wit, *Myrmecophaga jubata*, *Orycteropus capensis*, *Bradypus didactylus*, *Elephas indicus*, *E. africanus*, and *Balæna boops*. To these must now be added *Trichechus rosmarus* and *Otaria jubata*.

Structure and Form.—The red blood-corpuscles of the Hippopotamus, *Otaria*, and *Trichechus* conform in structure and shape to the regular apyrenæmatous type. Nor among the Mammalia has any indubitable exception to the apyrenæmatous character of these corpuscles yet been found.

4. Contributions to a History of the Accipitres or Birds of Prey. By R. Bowdler Sharpe, F.L.S., F.Z.S., &c., of the Zoological Department, British Museum.—I. On the Females of the Common and South-African Kestrels.

[Received August 5, 1874.]

(Plate LXVIII.)

A short time ago I received from my friend Mr. Bygrave Wharton a pair of Common Kestrels which he had recently obtained in Hertfordshire along with the nest and eggs; and the female of this bird wears such a curious plumage that I have thought it worthy of being brought before the notice of the Society. She is fully adult, having been, indeed, trapped on the nest, but has almost the tail of a male bird, blue with a few black bars. My views on the relation of the British avifauna to that of the continent of Europe are, I believe, now so well known that I shall be excused for bringing forward this female Kestrel as a further evidence of the tendency of our indigenous birds to show the effects of their insular habitat, of which *Parus britannicus* and *Acredula vagans* are forcible examples. For I may as well state that my faith in these last-named species is not in the least shaken, despite the cheers for a "*conservative* reaction" given by Dr. Sclater ('Ibis,' 1874, p. 173) on account of Professor Newton's refusal to recognize, in his edition of 'Yarrell,' the specific titles bestowed on the British Titmice. I am thankful to say that all the continental naturalists to whom I have shown the birds are more "*liberal*" in their tenets—and naturally so; for neither Professor Newton nor any one else has yet recorded an olive-backed Coal Titmouse from the continent of Europe; and however nearly *Parus britannicus* in its *worn breeding-plumage* may approach the blue-backed *P. ater*, birds killed in autumn, winter, and spring can scarcely be mistaken for that species.

Returning once more to *Cerchneis*, I notice that the discovery of a female of *C. tinnunculus* with a blue tail renders invalid the characters which I have assigned to the hen *C. rupicola* in my 'Catalogue of Birds;' and it therefore becomes necessary to reexamine the two species, to establish, if possible, a permanent character between them. In Dresser's 'Birds of Europe,' when I was part author, the Common Kestrel was described and figured; and we then had occasion to remark on the dark form of Kestrel which occurs along the southern range of *C. tinnunculus*, from Madeira through Senegambia to Abyssinia, in the Himalayas, China, and Japan. At p. 426 of the 'Catalogue' I again draw attention to this dark form: and I may be allowed to quote a few remarks I make there on the plumage of the female:—"Through all these dark races of Kestrel one character is predominant in addition to the richer and more intense coloration of the male bird, viz. that the female has more or less of a shade of blue on the rump and tail, which sometimes overspreads the whole of the latter." The Hertfordshire female, however, differs from those alluded to in the above paragraph in having an entirely blue tail regularly banded across with black, and the rump also blue with a few black shaft-streaks. And if any one takes this specimen for elucidation by means of the "Key to the Species" of *Cerchneis* (p. 423), they will find that it will appear as an adult female of *Cerchneis rupicola*, the South-African Kestrel, and is further closely allied to that of *C. moluccensis*. That a hen bird killed in England along with an ordinary male Kestrel can be either one or the other of these species is impossible; but we may look upon it as exhibiting a tendency to vary in our indigenous species in the same way as the Madeira bird does in a more southern latitude.

In [illegible] it approaches closely to a specimen of *C. japonicus*, but this bird has not such a thoroughly blue tail.

I add a few measurements of Kestrels, as those given in my 'Catalogue' do not give an exact idea of the proportions of *C. tinnunculus* and *C. rupicola*, the former appearing rather too small.

α. *C. tinnunculus*.

	Total length.	Wing.	Tail.	Tarsus.
a. ♂ ad. Thuringia	13·5	9·6	6·7	1·4
b. ♀ ad. Amoor, N.E.	14·1	10·2	7·0	1·5
c. ♂ ad. [illegible]	14·[illegible]	10·0	7·5	1·5
d. ♂ ad. Nepal	14·6	10·3	7·3	1·6
e. ♂ ad. [illegible]	15·[illegible]	10·4	7·3	1·6
f. ♂ juv. Bengal	13·0	9·4	6·6	1·55

β. *C. tinnunculus* (dark race).

	Total length.	Wing.	Tail.	Tarsus.
a. ♀ ad. Aldenham, Herts.	14·[illegible]	9·5	7·0	1·55
b. ♀ imm. Foochow, China.	14·5	10·2	6·7	1·6

γ. *C. rupicola*.

	Total length.	Wing.	Tail.	Tarsus.
a. ♀ ad. Cape of Good Hope.	13·7	9·7	6·0	1·45
b. ♀ ad. Angola	14·0	9·6	6·6	1·45
c. ♂ ad. "	13·0	9·2	6·2	1·45
d. ♂ ad. "	13·0	8·8	5·9	1·4
e. ♂ ad. Cape of Good Hope.	13·5	10·1	6·2	1·55

Kestrels, like other accipitrine birds, are never very easy to measure; and it is seldom that two people measure the same bird with exactly the same results. The dimensions of these birds, therefore, can only be taken in a very broad and general sense; but supposing that in the above list we have an average series of specimens, the following result is obtained:—

	Male.	Female.
C. tinnunculus	Wing 9·4–10·4. Tarsus 1·4–1·6.	Wing 9·8–10·2. Tarsus 1·5–1·6.
C. rupicola	Wing 8·8–10·1. Tarsus 1·4–1·55.	Wing 9·6–9·7. Tarsus 1·45.

In the 'Catalogue' (p. 428) a series of *C. tinnunculus* measured as follows:—(♂) wing 9·3–10·2, tarsus 1·45–1·6; (♀) wing 9·5, tarsus 1·6; so that the full results of my measurements of this species show that the wing of the male varies from 9·3 to 10·4 inches, and its tarsus from 1·4 to 1·6 inch; while in the female the wing varies from 9·5 to 10·2 inches, and the tarsus from 1·5 to 1·6 inch. I discard the dimensions of *C. rupicola* given by me in the above-mentioned volume, as some error has certainly crept in there. The *general average*, therefore, of *C. tinnunculus* is larger than that of *C. rupicola*, although both species vary immensely. On looking over a series of both placed side by side, almost the only differences are the darker and more *chestnut* tone of the rufous in *C. rupicola* as compared with the paler and more *vinous* tint of *C. tinnunculus*, the darker and more *slaty blue* of the head and tail in *C. rupicola* compared with the paler and more *greyish blue* of those parts in *C. tinnunculus*. Below, the differences are very striking, the breast in *C. rupicola* being of a deep chestnut-fawn-colour with black spots, while in *C. tinnunculus* the under surface is fulvous fawn-colour with a slight vinous tinge. But the best character which separates the two species exists in the sides of the face of *C. rupicola* being entirely blue like the crown, with no fulvescent ear-coverts. The females of both species differ from the males in having rufous instead of blue heads; and whereas the hen of *C. rupicola* always has a blue tail banded with black, the ordinary plumage of the female *C. tinnunculus* is a rufous tail banded with black, excepting when a bluish shade is apparent on the tail of the dark form which inhabits the localities mentioned by me above. The specimen obtained by Mr. Wharton endangers the validity of the blue tail as a good character; but, for all this, the bird is a regular Common Kestrel with the pale under surface, and with greyish cheeks and ear-coverts, the sides of the neck being also light fulvous with blackish streaks; whereas in the female *C. rupicola* these parts are all deep rufous, with a very slight greyish shade on the upper ear-coverts.

While on the subject of Kestrels, I would draw attention to the fact that the Moluccan species includes two forms, as has been already pointed out by Professor Schlegel in his 'Valkvogels van Nederlandsch Indie' (p. 48). He says there, "the Kestrel of the Moluccas has been observed by our travellers in Java, Borneo, Celebes, in the Halmahéra group, Ceram, Amboina, Timor, and Flores. With the exception of Java, we possess specimens to the number of twenty-five collected in the localities above cited. On comparing them *inter se*, one sees that in all those killed in the Halmahéra group the brownish-red tinge is darker and extends over all the sides of the head, whilst the throat, as well as the forehead, borders more plainly on rufous. These individuals have been killed in different parts of Halmahéra and in the islands of Morotai, Ternate, Maréh, Tidore, and Batchian. We only possess three examples from the Ceram group; of which two, killed in Ceram and Amboina, are indistinguishable from those of the Halmahéra group, whilst the third one, by means of its clear tints, approaches more those from the other parts of the archipelago. Those from Borneo and Celebes have the colours less pronounced, and that of the region of the ear passes more or less perceptibly to whitish. It is the same in our example from Timor and in that from Flores; the latter is remarkable for the restricted number and minuteness of the dark spots on the back and wings." An excellent plate with three figures (pl. 1. figs. 3–5) illustrates Prof. Schlegel's remarks; and when I was in Leiden last year I saw the original specimens. Fig. 3 represents a Batchian specimen, fig. 4 the Flores bird referred to above, and fig. 5 the light-cheeked Ceram bird.

When examining the Leiden series of *C. moluccensis* I found that there was certainly a recognizable difference, as Professor Schlegel has pointed out, in birds from various localities; but I could not sepamay have specifically, as some of the neighbouring islands produced more or less intermediate forms. Birds from the following localities had a conspicuous silvery-white shade on the ear-coverts—Flores, Celebes, Borneo, Timor, Amboina, and Ceram; while specimens from the following islands had dark ear-coverts and forehead—Gilolo, Batchian, Morty, Mareh, Ternate, Tidore, and Ceram. The darkest were those from Batchian, Morty, and Mareh, while those from Ternate, Tidore, and Ceram had an appearance of silvery-white ear-coverts. The Amboina bird is noted by me as a bleached and faded specimen in worn plumage, while the one from Flores, figured by Professor Schlegel, I considered at the time to be an extremely old bird.

The accompanying drawing (Plate LXVIII.) represents an adult pair of C. moluccensis (figs. 1 & 2), a species which has never been well figured; and the Australian female of *C. tinnunculus* is also drawn (fig. [illegible]).

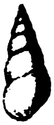
3. Descriptions of some new Species of Shells from various Localities; also of a new Genus of Bivalves from Mauritius. By Henry Adams, F.L.S.

[Received August 6, 1874.]

(Plate LXIX.)

Mr. Holdsworth having kindly placed in my hands for examination the shells recently obtained by him from the pearl-oyster beds at Ceylon, I find among them two species that appear to be new, as well as several known species which, from having been collected alive, still retain their opercula. Of one of the latter, viz. *Tudicla spirilla*, Lam., the operculum has not been hitherto observed, and is therefore now figured (Plate LXIX. fig. [illegible]). The genus *Tudicla* was included by my brother and myself in our 'Genera of Recent Mollusca,' in the family Fasciolariidæ; and Dr. Gray subsequently, in his 'Guide to the Mollusca,' placed it as a subgenus of *Murex* in the Muricidæ. The operculum of *Tudicla*, however, possesses similar characters to those of the other genera of Fasciolariidæ, being acutely ovate and having the nucleus apical; and I would consequently retain it in that family. The shell, moreover, is furnished with a plait upon the columella, is without varices, and has a papillary apex; while the shells of *Murex* have no plait, are all more or less variced, and have the apex acute.

I take this opportunity of figuring also (Plate LXIX. figs. 4, 4*a*, 4*b*) the operculum (hitherto unknown) of *Neritopsis*, from which it would appear that it is more closely allied to the Neritidæ than to the Naticidæ. The specimen containing this operculum was procured from Barkly Island, Mauritius. Among other shells received from Mauritius is an example of *Scintilla incerta*, Desh., described in his 'Cat. des Moll. de l'île de la Réunion' from a specimen obtained at that place; and he remarks that although he refers it to the genus *Scintilla*, he considers it to form an intermediate link between that genus and the genus *Galeomma*, possessing, as it does,



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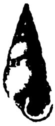
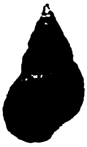


1a



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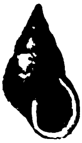
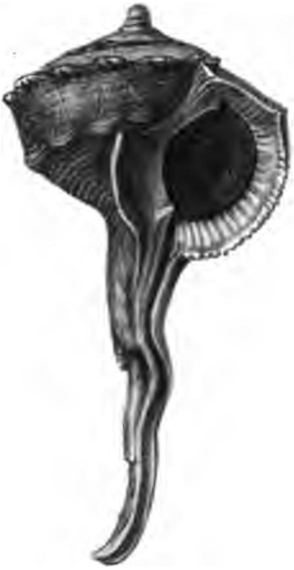


5a



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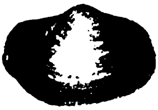

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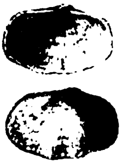

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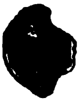
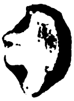
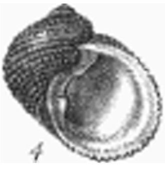


4a



4b



4

G Sowerby lith

M & N Hanhart imp

NEW SHELLS

the hinge and closed valves of the former with an external structure strongly resembling that of the latter. I would add that the valves of *Scintilla*, besides being furnished with hinge-teeth, are very thin and highly polished; and those of *Galeomma*, which are without hinge-teeth, are thin, sculptured, and gape widely in the middle; the valves of *S. incerta*, on the contrary, which are provided with hinge-teeth, are solid, not polished, and completely closed all round. This anomalous shell may, I think, be considered the type of a distinct genus, for which I propose the name *Barclayia*, after Sir David Barclay, to whose researches during his long residence at Mauritius we are indebted for much of the knowledge we possess of the interesting land Mollusca of that island.

APICALIA HOLDSWORTHI, sp. nov. (Plate LXIX. figs. 1, 1 *a*.)

A. *testa ovato-subulata, tenui, polita, cinereo-alba, versus apicem pallide rufa; spira acuminata, sutura distincta, fascia subpellucida angusta marginata; anfr.* 10, *apicalibus stylinis, cæteris convexiusculis, ultimo rotundato; apertura subovali; labio arcuato; labro valde sinuato, acuto.*

Long. 6, lat. 2½ mill.

Hab. Ceylon (*Holdsworth*).

TUDICLA SPIRILLA, Lam. (Plate LXIX. fig. 2.)

Operculum corneum, acuminato-ovale, nucleo apicali.

BARCLAYIA, gen. nov.

Testa transverse ovata, subæquilateralis, tumida, solida, omnino clausa, striis concentricis et striolis confertis radiantibus decussata; umbonibus subcentralibus vix prominentibus; margine crenulato. Cardo dentibus duobus contiguis tuberculæformibus instructus; ligamentum internum; linea pallialis simplex.

BARCLAYIA INCERTA, Desh. (Plate LXIX. fig. 3.)

Scintilla incerta, Desh. Cat. des Moll. de l'île de la Réunion, p. 18, pl. 2. figs. 16–18.

Long. 14, alt. 9, lat. 7 mill.

Hab. Bourbon (Réunion) (*Deshayes*); Mauritius (*Robillard*).

NERITOPSIS RADULA (Linn.). (Plate LXIX. figs. 4, 4 *a*, 4 *b*).

Operc. testaceum, crassum, subtriangulari-ovatum, subvitreum, externe perconvexum, interne subconcavum; margine exteriore circulari; margine columellari undulato, ad incisuram columellarem testæ accommodato; facie externa fastigiis nonnullis in plicas rotundatas desinentibus e margine externo radiantibus instructa; facie interna cicatrice confertim radiatim striata.

PALUDOMUS LUTEUS, sp. nov. (Plate LXIX. figs. 5, 5 *a*.)

P. *testa acuminato-ovali, solida, sub lente striis minutissimis, crebris, transversis, et striis longitudinalibus decussata, alba infra epidermide lutea; spira elevata, subconica, apice acuto, sutura distincta; anfr.* 8, *convexiusculis, ultimo amplo, antice vix at-*

tenuato; apertura verticali, subovali, marginibus callo crasso restricto junctis; columella arcuata; labro sinuato, obtuso, intus vix crenulato.

Long. 6, diam. 9 mill. Apert. intus 6 mill. longa, 4 lata.
Hab. Borneo.

Poromya forbesi, H. Ad. (Plate LXIX. fig. 6.)

P. *testa transversa, subovali, ventricosa, tenui, albida, subpellucida, radiatim exiliter punctata, epidermide tenui flavida scabra induta; umbonibus tumidis, eminentibus, submedianis: extremitate anteriori ovata; extremitate posteriori oblique truncata, ad marginem dorsalem compressa; margine ventrali arcuato.*

Long. 20, alt. 14, lat. 9 mill.
Hab. ——?

The genus *Poromya* of Forbes (=*Embla* of Lovén) has been considered to be synonymous with *Thetis* of Sowerby and *Eucharis* of Récluz. It should be kept separate from both, and they also be recognized as distinct genera. *Thetis*, of which I am not aware of there being any recent species, appears to belong to the family Veneridæ, while the others are members of Corbulidæ.

P.S.—Since writing the above I find that a specimen of *Neritopsis radula*, with its operculum, has been received by Dr. Souverbie from Ouagap, one of the Caroline Islands, and that the operculum has been described by him in the April Number of the 'Journal de Conchyliologie.'

EXPLANATION OF PLATE LXIX.

Fig. 1, 1 *a*. *Apicalia holdsworthi*, p. 585.
2. *Tudicla spirilla*, p. 585.
3. *Barclayia incerta*, p. 585.
4, 4*a*, 4*b*. Operculum of *Neritopsis radula*, p. 585.
5, 5 *a*. *Paludomus luteus*, p. 585.
6. *Poromya forbesi*, p. 586.

6. On some Points in the Anatomy of the Parrots which bear on the Classification of the Suborder. By A. H. Garrod, B.A., F.Z.S., Fellow of St. John's College, Cambridge, Prosector to the Society.

[Received September 15, 1874.]

(Plates LXX. & LXXI.)

In a former communication*, a review of certain of the most variable characters found amongst the *Columbæ* enabled me to give hints with regard to the mutual relationships of the different genera of that considerable family, which I hope will be found of service. On the present occasion it is my desire to follow out a similar method, taking the *Psittaci*, a suborder quite as, and perhaps even more, difficult to arrange by external features only.

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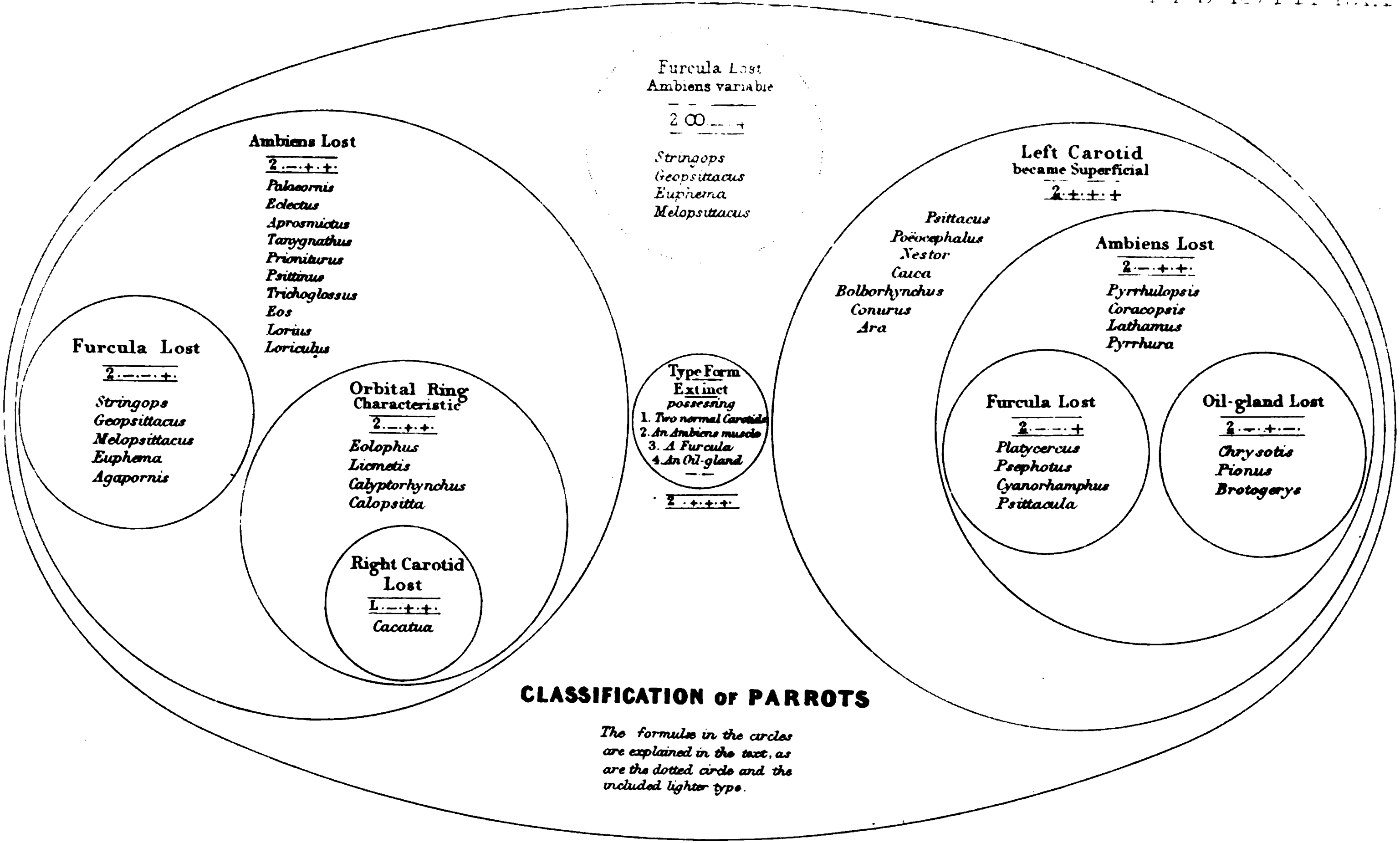
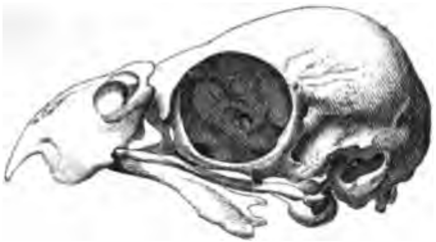
* P. Z. S. 1874, p. 249.



CLASSIFICATION OF PARROTS

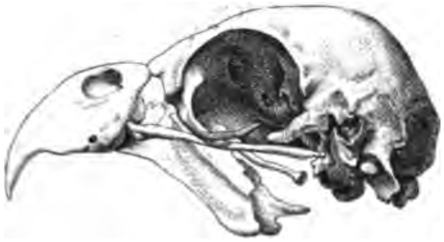
The formulæ in the circles are explained in the text, as are the dotted circle and the included lighter type.

Engraved by Edwᵈ Weller



EOLOPHUS ROSEICAPILLUS

Shewing the complete orbital ring with the extra temporal process characteristic of the Cacatuinæ.

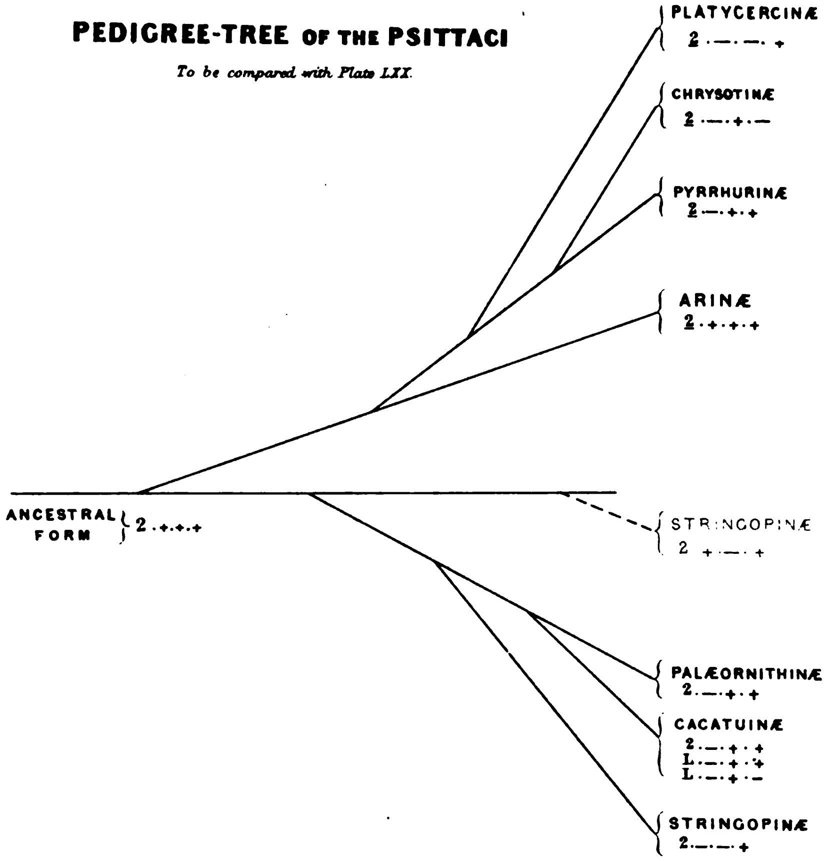


PYRRHULOPSIS SPLENDENS

Shewing the incomplete orbital ring & the absence of the temporal process.

PEDIGREE-TREE OF THE PSITTACI

To be compared with Plate LXX.



Engraved by Edw.d Weller.

The unequalled collection of living Parrots in the Society's Gardens, and the liberality of friends, have placed at my disposal specimens of the large number of 82 species, in all of which I have been able to note the characters laid stress on in this paper. To save repetition a list is here given of the species examined by me; and on all future occasions when a genus only is mentioned, it refers to those species of it which are contained in this list.

Names of Species examined.

Agapornis roseicapilla.
Aprosmictus erythropterus.
—— *scapulatus.*
Ara ambigua.
—— *ararauna.*
—— *macao.*
—— *maracana.*
Bolborhynchus monachus.
Brotogerys tiriacula.
—— *tovi.*
—— *pyrrhopterus.*
—— *virescens.*
Cacatua cristata.
—— *galerita.*
—— *leadbeateri.*
—— *sulphurea.*
Caïca melanocephala.
Calopsitta novæ-hollandiæ.
Calyptorhynchus banksii.
Chrysotis agilis.
—— *collaria.*
—— *festiva.*
—— *levaillantii.*
—— *ochrocephala.*
Conurus æruginosus.
—— *aureus.*
—— *aztec.*
—— *hæmatorrhous.*
—— *holochlorus.*
—— *jendaya.*
—— *monachus.*
—— *nanday.*
—— *pavua.*
—— *petzii.*
—— *xantholæmus.*
Coracopsis barklyii.
Cyanorhamphus auriceps.
—— *novæ-zealandiæ.*
Eclectus polychlorus.
Eolophus roseicapillus.
Eos indica.
Eos riciniata.
Euphema aurantia.
—— *bourkii.*
—— *pulchella.*
—— *splendida.*
Geopsittacus occidentalis.
Lathamus discolor.
Licmetis pastinator.
Loriculus asiaticus.
—— *chrysonotus.*
—— *galgulus.*
Lorius cardinalis.
—— *lori.*
—— *tricolor.*
Melopsittacus undulatus.
Nestor meridionalis.
—— *notabilis.*
Palæornis alexandri.
—— *erythrogenys.*
—— *longicaudus.*
—— *torquata.*
Pionus menstruus.
—— *sordidus.*
Platycercus eximius.
—— *pallidiceps.*
—— *zonarius.*
Pœocephalus fuscicapillus.
—— *senegalensis.*
Prioniturus, sp.
Psephotus hæmatogaster.
—— *pulcherrimus.*
Psittacus erithacus.
Psittacula passerina.
Psittinus malaccensis.
Pyrrhulopsis splendens.
Pyrrhura leucotis.
—— *vittata.*
Stringops habroptilus.
Tanygnathus muelleri.
Trichoglossus concinnus.
—— *novæ-hollandiæ.*

The points to which my attention has been directed, on account of the variations observed, are :—

1. The arrangement of the carotid arteries ;
2. The presence or absence of the ambiens muscle ;
3. The presence or absence of the furcula ;
4. The presence or absence of the oil-gland ;

and others of minor importance, such as the complete encirclement of the orbit by bone, and the peculiarities of the atlas vertebra. These will be considered separately.

I. *The arrangement of the carotid arteries among the Parrots.*

In my paper on the carotid arteries of birds, the peculiarities of these vessels in the Parrots are described, it being shown that three different arrangements of these vessels obtain, and perhaps a fourth. Either the two carotids may run normally, independent, and side by side up the front of the neck, in the hypapophysial canal ; or the right, as usual, traverses that canal, whilst the left runs superficially along the side of the neck in company with the left pneumogastric nerve and the jugular vein ; or the left carotid may alone be developed, as in the Passeres and many other birds. It has been stated that Meckel found a fourth arrangement in *Cacatua sulphurea* ; but in a specimen of that species recently dissected by me, the left only was present, as in *C. cristata*, *C. leadbeateri*, and *C. galerita*.

To make this paper complete in itself, and to incorporate those dissections performed since the other was published, a list of all the Parrots which I have examined, together with the condition observed in them is given.

1. The two carotids are present, running normally, side by side, in

Agapornis.
Aprosmictus,
Calopsitta,
Calyptorhynchus,
Eclectus,
Eolophus,
Eos.
Euphema,
Geopsittacus,
Licmetis,
Loriculus,
Lorius,
Melopsittacus,
Palæornis,
Prioniturus,
Psittinus,
Stringops,
Tanygnathus,
Trichoglossus.

2. The left carotid only is present in

Cacatua.

3. The two carotids are present, the right having its normal course, the left running superficially along with the left pneumogastric nerve in

Ara,
Bolborhynchus,
Brotogerys,
Caïca,
Chrysotis,
Conurus,
Coracopsis,
Cyanorhamphus,

Lathamus,
Nestor,
Pionus,
Platycercus,
Pœocephalus,
Psephotus,
Psittacus,
Psittacula,
Pyrrhulopsis,
Pyrrhura.

It may be observed that the only other well-defined groups of birds in which the carotids vary are the Cypselidæ, Gallinæ, Struthiones, and Otididæ.

II. *The presence or absence of the ambiens muscle.*

The ambiens muscle, the tendon of which crosses the front of the knee-capsule obliquely from above downwards and outwards, and ultimately forms part of the flexor perforans digitorum, is present in the following genera—

Ara,
Bolborhynchus,
Caïca,
Conurus,
Nestor,
Pœocephalus,
Psittacus,
Stringops.

It is absent in

Agapornis,
Aprosmictus,
Brotogerys,
Cacatua,
Calopsitta,
Calyptorhynchus,
Chrysotis,
Coracopsis,
Cyanorhamphus,
Eclectus,
Eolophus,
Eos,
Euphema,
Geopsittacus,
Lathamus,
Licmetis,
Loriculus,
Lorius,
Melopsittacus,
Palæornis,
Pionus,
Platycercus,
Prioniturus,
Psephotus,
Psittacula,
Psittinus,
Pyrrhulopsis,
Pyrrhura,
Tanygnathus,
Trichoglossus.

The only other well-defined groups of birds in which the ambiens muscle is known to vary are the Columbæ and the Struthiones.

III. *The presence or absence of the furcula.*

By this expression is meant the presence or absence of the furcula as a complete bone; for in those Parrots in which it is said to be absent, the scapular ends of the two parts of which it is composed are frequently to be found, being of considerable length in *Stringops* and some of its allies.

The furcula is complete in

Aprosmictus,
Ara,
Bolborhynchus,
Brotogerys,
Cacatua,
Caïca,

Calopsitta,
Calyptorhynchus,
Chrysotis,
Conurus,
Coracopsis,
Eclectus,
Eolophus,
Eos,
Lathamus,
Licmetis,
Loriculus,
Lorius,
Nestor,
Palæornis,
Pionus,
Pœocephalus,
Prioniturus,
Psittacus,
Psittinus,
Pyrrhulopsis,
Pyrrhura,
Tanygnathus,
Trichoglossus.

The furcula is but partially developed or absent in

Agapornis,
Cyanorhamphus,
Euphema,
Geopsittacus,
Melopsittacus,
Platycercus,
Psephotus,
Psittacula,
Stringops.

Dr. Finsch, in his monograph on the Parrots*, has given a list of those species in which the condition of the furcula has been recorded, which is very complete, embracing most of the above genera.

IV. *The presence or absence of the oil-gland.*

When present the oil-gland is always tufted in the Parrots. Nitzsch, in his work on pterylosis†, has recorded its absence in some of the genera.

It is present in the following genera:—

Agapornis,
Aprosmictus,
Ara,
Bolborhynchus,
Caïca,
Calopsitta,
Calyptorhynchus,
Conurus,
Coracopsis,
Cyanorhamphus,
Eclectus,
Eolophus,
Eos,
Euphema,
Geopsittacus,
Lathamus,
Licmetis,
Loriculus,
Lorius,
Melopsittacus,
Nestor,
Palæornis,
Platycercus,
Pœocephalus,
Prioniturus,
Psephotus,
Psittacula,
Psittacus,
Psittinus,
Pyrrhulopsis,
Pyrrhura,
Stringops,
Tanygnathus,
Trichoglossus.

It is absent in

Brotogerys,
Chrysotis,
Pionus.

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* Die Papageien, Bd. i. p. 197.

† Pterylography, English edition, p. 98 *et seq.*

In *Cacatua galerita* and *C. leadbeateri* it is present; but it is generally wanting in *C. cristata*, and has not been found in *C. sulphurea*.

The above facts may be tabulated in a form which makes their significance more readily apparent, by placing those together in which a similar arrangement is observable. Thus there are:—

1. Parrots in which there are two normally situated carotids, no ambiens muscle, a furcula, and an oil-gland—namely

Aprosmictus,
Calopsitta,
Calyptorhynchus,
Eclectus,
Eolophus,
Eos,
Licmetis,
Loriculus,
Lorius,
Palæornis,
Prioniturus,
Psittinus,
Tanygnathus,
Trichoglossus.

2. Parrots in which there are two normally situated carotids, no ambiens muscle, no furcula, and an oil-gland—namely

Agapornis,
Euphema,
Geopsittacus,
Melopsittacus.

3. Parrots with a left carotid only, no ambiens muscle, a furcula, and generally an oil-gland—namely

Cacatua.

4. Parrots with two carotids (the left being superficial), an ambiens muscle, a furcula, and an oil-gland—namely

Ara,
Bolborhynchus,
Caïca,
Conurus,
Nestor,
Pœocephalus,
Psittacus.

5. Parrots with two carotids (the left being superficial), no ambiens muscle, a furcula, and an oil-gland—namely

Coracopsis,
Lathamus,
Pyrrhulopsis,
Pyrrhura.

6. Parrots with two carotids (the left being superficial), no ambiens muscle, a furcula, and no oil-gland—namely

Brotogerys,
Chrysotis,
Pionus.

7. Parrots with two carotids (the left being superficial), no ambiens muscle, no furcula, and an oil-gland—namely

Cyanorhamphus,
Platycercus,
Psephotus,
Psittacula.

The true significance of these facts next requires attention; and the principle upon which all attempts at the formation of a satisfactory genealogy or classification of the suborder can be arrived at must be borne in mind throughout. It is the following:—An anatomical character is so much the more or less certain to have been an element of the original type or ancestor whence sprang the class, order, family, or genus under consideration as it is more or less frequently found in the less intimately related minor divisions of the groups under observation. An example will make this more clear:—Two large arteries (the carotids), one on each side, run up to supply the head in most Pulmonate Vertebrata, as far as I know. In all Mammalia such is certainly the case. In many Birds there are, similarly, two carotids, though some have only one. It is therefore more than probable that the ancestral bird had two carotids, those in which one is absent having lost it subsequently. Many Parrots have two carotids; the genus *Cacatua* is characterized by the left only being present: it, therefore, has in this respect departed most from the ancestral type. Again, other Vertebrata and other Birds with both carotid arteries present have them symmetrically placed; many Parrots have symmetrical carotids; but in some the left (and the left only) is abnormal in being superficial: therefore, from the same considerations, these last have differentiated off from the parent stem, and, what is more, this peculiarity can hardly have occurred on more than one occasion, as it is otherwise unique and therefore peculiar and exceptional in origin.

There is another principle to be remembered, which is that there is no such thing as reversion to lost ancestral anatomical characters. The genus *Cacatua* has lost its right carotid, as have the whole family of the Passeres and many others. There is not a tittle of evidence in favour of the assumption that they or their descendants could ever regain that vessel. Its arrested development is a positive act, the result of extra forces coming into play in early embryonic life, to remove which would require the introduction of a certain definite series of counterbalancing forces superadded to those already in action; whilst, in the ancestral bird, the persistence of the two arteries resulted from the absence of any impediment to their development. The probability that the ancestral form should be reverted to cannot be greater than that an entirely new arrangement should be effected. That some domestic excentric varieties should tend in some cases to revert to the wild type can have no more bearing on the general subject than the similar tendency to exaggeration which is not apparent in the feral forms.

Upon these principles many deductions can be made as to the mutual relations of the several genera of the Psittacine suborder. For instance, it must be inferred that the ancestral Parrot possessed two carotids, running symmetrically in front of the neck, and that the ambiens muscle was present, as was the furcula and the tufted oil-gland. The intestinal cæca and gall-bladder must have been absent or lost very early, as must the postacetabular portion of the tensor fasciæ muscle*; for they are none of them to be found in any existing species; whilst the beak, tongue, crop, and rectrices must have possessed the characteristic features, which are not found to vary to any important extent. The pterylosis of the suborder forms a considerable but much involved field for work, which has only been entered upon by the illustrious Nitzsch.

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* *Vide* P. Z. S. 1873, p. 638.

Referring back to the characterizing features of the existing species whose internal structure has been noted, it will be seen that none has as yet been found with a conformation exactly similar to that of the above-described ancestral bird; in other words, no existing Parrot has been seen with two normal carotids, an ambiens muscle, a furcula, and an oil-gland. By more than a single way, however, this condition, with only one exceptional character, is found to exist. For instance, the fourth combination above given, in which the ambiens, furcula, and oil-gland are present at the same time that the carotids are abnormal (the left being superficial), agrees with the type except in one point—the disposition of the carotid arteries. Again, in the first of the combinations the only deviation from the type consists in the absence of the ambiens muscle.

These two different directions of variation must therefore have formed the secondary stems from which the more specialized genera subsequently sprang. In other words, the main stem must have given rise to two, in one of which the carotids remained normal, whilst in the other the left became superficial. The following are the genera as they will thus appear:—

Genera in which the left carotid
has remained normal.

(PALÆORNITHIDÆ.)

Agapornis.
Aprosmictus.
Cacatua.
Calopsitta.
Calyptorhynchus.
Eclectus.
Eolophus.
Eos.
Euphema.
Geopsittacus.
Loriculus.
Lorius.
Melopsittacus.
Palæornis.
Prioniturus.
Psittinus.
Stringops.
Tanygnathus.
Trichoglossus.

Genera in which the left carotid
has become superficial.

(PSITTACIDÆ.)

Ara.
Bolborhynchus.
Brotogerys.
Caïca.
Chrysotis.
Conurus.
Coracopsis.
Cyanorhamphus.
Lathamus.
Nestor.
Pionus.
Platycercus.
Pœocephalus.
Psephotus.
Psittacus.
Psittacula.
Pyrrhulopsis.
Pyrrhura.

Each of these secondary types must have then become a centre for variation in itself. From the 4th combination, in which only the carotids are peculiar, sprang the 5th, 6th, and 7th, with the ambiens deficient, just in the same way that the 1st, 2nd, and 3rd combinations originated from the ancestral form by the same process of reduction. The loss of the furcula and of the oil-gland (though never, as it happens, both together) have further aided in the formation of tertiary and further subdivisions, which, upon the dissections above given, would lead to the arrangement of the family which is depicted in Plate LXX.

This may be represented in the tabular form as follows:—

Suborder (or Cohort) PSITTACI.

Family I. Palæornithidæ. (Left carotid normal.)

The ambiens muscle absent. Carotids two, except in the genus *Cacatua*.

Subfamily (1) Palæornithinæ. No further deviation.

- *Palæornis.*
- *Eclectus.*
- *Aprosmictus.*
- *Tanygnathus.*
- *Prioniturus.*
- *Psittinus.*
- *Loriculus.*
- *Trichoglossus.*
- *Lorius.*
- *Eos.*

Subfamily (2) Cacatuinæ. Orbital ring completely ossified, and characteristic in that it develops a process bridging the temporal fossa (*vide* Plate LXXI.).

- *Calopsitta.*
- *Calyptorhynchus.*
- *Licmetis.*
- *Eolophus.*
- *Cacatua.*

Subfamily (3) Stringopinæ. The furcula lost *.

- *Stringops.*
- *Euphema.*
- *Geopsittacus.*
- *Melopsittacus.*
- *Agapornis.*

Family II. Psittacidæ. (Left carotid superficial.)

Division 1. The ambiens muscle present.

Subfamily (4) Arinæ. No further deviation.

- *Ara.*
- *Conurus.*
- *Bolborhynchus.*
- *Caïca.*
- *Psittacus.*
- *Pœocephalus.*
- *Nestor.*

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* See the special remarks on this group in the postscript to this paper.

Division 2. The ambiens muscle wanting.

Subfamily (5) PYRRHURINÆ. No further deviation.

Pyrrhura.
Lathamus.
Coracopsis.
Pyrrhulopsis.

Subfamily (6) PLATYCERCINÆ. Furcula lost.

{ *Platycercus.*
{ *Psephotus.*
{ *Cyanorhamphus.*
Psittacula.

Subfamily (7) CHRYSOTINÆ. Oil-gland lost.

{ *Chrysotis.*
{ *Pionus.*
Brotogerys.

In phyllogenetic language this arrangement would be expressed thus:—The original stem, in which the carotids were normally disposed, gave off a branch characterized by their abnormal arrangement. The continuation of the main stem, as well as the branch, shortly lost the ambiens muscle—the latter (and not the former), however, being represented at the present day in its unmodified form by the Arinæ. Each of the two secondary branches persist as the Palæornithinæ and the Pyrrhurinæ respectively, they both branching dichotomously in an exactly similar manner, the former giving rise to the Stringopinæ and the specially modified *Cacatua cristata* and *C. sulphurea*, the other to the similarly modified Platycercinæ and Chrysotinæ.

A method of formulation will assist in making this more readily intelligible. If the presence of two carotids, normally disposed, is represented by the figure 2, the abnormal arrangement may be represented by 2. Then, if the presence or absence of the varying structures be represented by + or −, the following Table will express the characteristics of the different subfamilies:—

	Carotids.	Ambiens.	Furcula.	Oil-gland.
Palæornithinæ	2	−	+	+
Cacatuinæ .... {	2	−	+	+
	L	−	+	−
Stringopinæ	2	−	−	+
Arinæ...	2	+	+	+
Pyrrhurinæ	2	−	+	+
Platycercinæ	2	−	−	+
Chrysotinæ	2	−	+	−
Type form...........	2	+	+	+

The Palæornithinæ will thus be represented by the formula 2, −, +, +; the Arinæ by 2, +, +, +; and so on. Plate LXXI. will represent these facts in a more self-evident manner.

Through the kindness of Prof. Flower and also from the death of the specimen presented by Mr. Murdoch to the Society, I have twice had the opportunity of dissecting *Stringops habroptilus*. As a Parrot it is not so strikingly peculiar as many seem to think. Its wings are useless, and the carina sterni is correspondingly reduced, it is true; but as points of classificational importance, I regard these as insignificant. The points of special anatomical interest which it does possess, however, are particularly instructive. The proximal ends of the incomplete furcula are well developed, so much so that it might at first sight seem that their symphysial ends are only lost in correlation with the excessive reduction of the powers of flight; though this is probably not the case, because the allied similarly modified genera *Euphema* &c. do not keep to the ground.

Further, in the Society's specimen above mentioned, though the ambiens muscle did not cross the knee, yet its fleshy belly was well differentiated on both sides, its thin tendon being lost over the capsule of the joint. In the College of Surgeons' specimen, however, this muscle was entirely absent in the only knee which was in a fit state for dissection, the other being much shot. It is only in the genus *Œdicnemus* that I have elsewhere found a similar partial loss of the ambiens*. The partial development of this muscle in this particular instance shows that the tendency to lose it is not of great antiquity; and it is to be noted that there is no other Parrot with normal carotids in which any trace of an ambiens is to be found. These considerations suggest, what may perhaps be the case, as is suggested by the peculiarities of their geographical distribution, that *Agapornis* may be the representative among the normal-carotid Parrots of the Platycercine branch from the Arinæ, whilst the Stringopinæ proper (including *Geopsittacus*, *Melopsittacus*, and *Euphema*) are more direct continuations of the main stem, as indicated by the dotted portions of the diagrams (Plates LXX. and LXXI.), *Stringops* itself being the nearest living representative of the common ancestor of the whole suborder.

Further, it may be worth while taking a glance at some of the most important changes which my classification would necessitate. Taking Mr. Sclater's 'Revised List of Vertebrated Animals in the Society's Gardens' as a good representative of current opinion, the Order PSITTACI is there divided into two families and seven subfamilies, thus:—

Order PSITTACI.
  Family I. STRINGOPIDÆ.
  Family II. PSITTACIDÆ.
    Subfamily 1. CACATUINÆ.
    ,, 2. ARINÆ.
    ,, 3. PLATYCERCINÆ.
    ,, 4. PSITTACINÆ.
    ,, 5. LORINÆ.
    ,, 6. NESTORINÆ.

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* *Vide* P. Z. S. 1873, p. 640.

As far as the major division is concerned, the facts brought forward in the present communication suggest a different arrangement, as shown above, which would approximately distribute these subfamilies thus:—

Family I.
Stringopidæ.
Lorinæ.
Cacatuinæ.
Platycercinæ (in part).
Psittacinæ (in part).

Family II.
Arinæ.
Platycercinæ (in part).
Psittacinæ (in part).
Nestorinæ.

The generally received families Platycercinæ and Psittacinæ are avowedly rather incongruous mixtures. Mr. Gould, with acute perception, was able to differentiate *Aprosmictus* from *Platycercus*, chiefly by its habits of life; and anatomical considerations show that Dr. Finsch's attempt to reabsorb it in the older genus is a retrograde step. If Dr. Meyer is right in stating that the sexes in *Eclectus* are of different colours, its relations to *Aprosmictus* may be very intimate.

It may at first sight seem very heretical to remove *Lathamus* from the Lorinæ, the brush-tongue being considered characteristic of that subfamily. To the unbiased student, however, the brush-tongue is a character not more important than several of those that have been above considered. It is only an excessive development of the papillæ which are always present on the lingual surface, and is seen in a slightly different form in the lion and other Felidæ. The character of the papillæ is somewhat different in *Lathamus* from what it is in *Lorius*, they being blunter and shorter in the former genus than in the latter.

The totally different geographical distribution of *Palæornis* and the true Arinæ is quite opposed to Dr. Finsch's proposition that *Conurus* and *Brotogerys* should be the neighbours of the Palæarctic genus.

Brotogerys entirely agrees in structure with *Chrysotis* and *Pionus*, differing greatly from *Conurus*; whilst in itself *Conurus*, as generally received, embodies the red-tailed species, with the fourth primary not acuminate, and the green-tailed species, with an acuminate fourth primary. In the former section (*Pyrrhura*) the ambiens muscle is quite lost, whilst in the latter (*Conurus*) it is always well developed.

Prof. Huxley is not the only naturalist who has been puzzled by the geographical distribution of *Psittacula*. This genus in its wide sense, however, is broken up into far separated genera—the Old-World *Psittinus* and *Agapornis* differing entirely from the New-World *Psittacula*, *Agapornis* being the homologue, as it may be termed, in the normal-carotid Parrots of *Psittacula* in the other group, whilst *Psittinus* is a less-differentiated genus of the former division.

Nestor no doubt stands rather isolated; but possessing the ambiens muscle, as well as all the other characters of *Psittacus* and the true Arinæ, it must be classed with them.

My subfamily Pyrrhurinæ seems a mixture; and all I can say in its favour is that the combination of anatomical characters is exactly the same in all its genera, which have a very scattered distribution.

It will be noticed that no Parrots with normal carotids occur in the New World; and, as far as I know, none but members of that group have red beaks.

P.S. (December 8th, 1874).—On the 25th of last month, from the death of one of the specimens of *Stringops habroptilus*, recently purchased by the Society, I have had an opportunity of dissecting a third individual of the species. In it the ambiens muscle is complete, of fair size, at the same time that it crosses the knee as in *Psittacus*. This makes me feel more convinced that the arrangement indicated by the dotted portions of the diagram plates accompanying this communication is the correct one, and that the main stem has given rise to three instead of two branches—the Stringopinæ being the nearest representatives of the ancestral form, some of its members (*Geopsittacus*, *Melopsittacus*, *Euphema*, and *Cyanorhamphus*) having quite recently lost, whilst *Stringops* itself is just now on the point of losing the ambiens muscle. It is, however, quite possible, if external resemblances and geographical distribution are left out of consideration, that *Stringops* must stand as the sole representative of the Stringopinæ, thus conforming with generally received ideas; and that *Geopsittacus*, together with *Melopsittacus*, *Euphema*, and *Cyanorhamphus*, must be placed with *Agapornis* as part of the family Agapornithinæ, in which the formula is 2,—,—,+. The close external resemblance between *Stringops* and *Geopsittacus* nevertheless makes me indisposed to adopt this view.

7. Descriptions of five new Species of Shells.

By G. B. Sowerby, Jun.

[Received September 15, 1874.]

(Plate LXXII.)

1. Triton (Epidromus) comptus, sp. nov. (Plate LXXII. figs. 5, 5 *a*.)

T. *testa oblongo-turrita, rufo-fusca, castaneo maculata, undique creberrime decussate lirata, liris eximie granulosis, interstitiis transversim striatis; anfractibus rotundatis, maculis angustis oblongis transversim balteatis; varicibus paucis, rotundatis, castaneo grandimaculatis; apertura subexpansa, labio externo reflexo, lævi, ad marginem lineis castaneis minutis notatis; lamina columellari lævi, pellucida, polita; canali brevissimo recurvo: long.* 54, *lat.* 20; *apert. long.* 20, *lat.* 10 *mill.*

Shell of the usual general form of an *Epidromus* (Klein) as separated from the genus *Triton* (Lamarck), reddish-brown colour, blotched and spotted with dark chestnut-brown, closely and exquisitely cancellated and granulated; whorls rounded, belted with narrow oblong spots; varices few, rounded, with large chestnut blotches; aperture rather expanded; outer lip reflexed, smooth, with small linear chestnut spots at the edge; columella covered with a smooth polished transparent enamel; canal very short, recurved.

Hab. Hongkong.

A single specimen of this very beautiful species was dredged by William Cuthill, Esq., in the vicinity of Hongkong. A specimen of it in the old collection of the British Museum had been inadvertently confounded with *Triton Sowerbyi* (Reeve), from which it is obviously distinct. The shell presents characters common to several species, but differs from all its congeners in the form of the whorls being more rounded, and in the smoothness of the mouth. Its nearest analogue is perhaps *T. testaceus* (Mörch), from which it differs in the last whorl being larger, the mouth more open, and the spire more acute. It differs in the same respects from *T. clathratus* (Sowerby), besides being much more finely cancellated.

2. OVULUM SINENSE, sp. nov. (Plate LXXII. figs. 1, 1 *a*.)

O. *testa pyriformi, ventricosa, antice subattenuata, utrinque subrostrata, tenuiuscula, subpellucida, alba, linea aurantiaca ad marginem cincta, transverse obsolete striatula, striis longitudinalibus irregularibus obscure decussata; apertura subpatula, arcuata, intus lactea; columella superne calloso lirata, inferne subexcavata, ad canalem valide uniplicata; labio externo denticulato: long.* 30, *lat.* 19, *alt.* 13. *mill.*

Shell pyriform, ventricose, somewhat attenuated posteriorly, slightly beaked at both ends, rather thin, semitransparent, white, encircled with an orange line at the margin, very obscurely decussated; aperture rather wide, arched, milk-white within; columella with a thickened ridge at the upper part, somewhat excavated below, with a strong plait at the canal; outer lip denticulate.

Hab. Hongkong (*Cuthill,* two specimens).

There is a specimen of this species also in the British Museum, which was placed with *O. adriaticum,* from which it differs considerably in form and structure, being much stronger and more ventricose.

3. STROMBUS ROBUSTUS, sp. nov. (Plate LXXII. figs. 3, 3 *a*.)

S. *testa conica, solida, ventricosa, cæruleo-alba, castaneo zonata et maculata; spira parviuscula acuta; anfractibus noduloso-angulatis, superne spiraliter striatis; anfractu ultimo in medio fere lævi, deinde versus marginem conspicue striato, ad basin sulcato; apertura elongata, canali superne spiram ascendente; columella callosa, alba, obsolete lirata; labio externo emarginato, intus lirato: long.* 48, *lat.* 31 *mill.*

Var. β testa luteo-fusco fasciata.

Shell conoid, solid, ventricose, bluish white, banded and blotched with dark brown; spire rather short, acute; whorls angulated and noduled at the angle, spirally striated above; last whorl almost smooth in the middle, then towards the margin conspicuously striated, grooved at the base; aperture elongated, with a canal at the upper part, running up the spire; columella furnished with a thickened white enamel, which is faintly ridged; outer lip emarginated; interior ridged.

Hab. Hongkong (*Cuthill*).

The characters of this species are much the same as those of *S. septimus* (Duclos), of which Mr. Cuthill has sent me several specimens from the same locality; but the form is very different, the latter being a narrow shell of the form of *S. succinctus* (Linn.), which is found in Ceylon.

4. COLUMBELLA (ANACHIS) SINUATA, sp. nov. (Plate LXXII. figs. 2, 2 *a*.)

C. *testa fusiformi, rufo-fusca, cæruleo-albo et brunneo variegata, tenui, pellucida; spira acuminata; anfractibus* 9, *planato-convexis, lævibus, longitudinaliter regulariter valide costatis; costis ad anfractum ultimum, versus marginem medio tuberculatis; apertura oblonga, intus cærulea, costata; columella corrugata, tenuiter encaustica; canali brevi, profundo, recurvo; labio externo superne elevato, expanso, incrassato, medio sinu lato profundo emarginato: long.* 17, *lat.* 9 *mill.*

Shell fusiform, reddish brown, variegated with bluish white and dark brown, thin, transparent; spire acuminated; whorls nine in number, flatly convex, smooth, strongly ribbed longitudinally; the ribs on the last whorl towards the margin tuberculated in the middle, transversely ribbed at the base; aperture oblong, interior blue, ribbed; columella wrinkled, covered with a transparent, shining enamel; canal short, deep, recurved; outer lip thickened and expanded at the upper part, and with a broad deep sinus in the middle.

Hab. Upper California.

A very remarkable little shell, almost generically distinct from any hitherto known species; I think, however, it truly belongs to the section *Anachis* (H. & A. Adams). The sinus is almost like that of a *Pleurotoma*; only it is in the middle of the lip.

5. AMPULLARIA CATAMARCENSIS, nov. sp. (Plate LXXII. fig. 4.)

A. *testa subglobosa, imperforata, solidiuscula, lutescenti-alba, atrofusco fasciata, undique subtilissime reticulata; epidermide tenui, lutescente; spira exserta, parviuscula, subacuta; anfractibus convexis; apertura ampliuscula; columella callosa, fusco suffusa; labio externo subincrassato, vix reflexo: long.* 70, *lat.* 60; *apert. long.* 50, *lat.* 35 *mill.*

Shell rather globose, imperforate, rather solid, yellowish white, banded with dark brown, throughout very finely reticulated; epidermis thin, yellowish; spire rather small, exserted; whorls convex; aperture rather wide; columella thickened, suffused with brown; outer lip somewhat thickened, scarcely reflexed.

Hab. Catamarca (on the Andes of Peru).

A fine species of the type represented by *A. columellaris*.

EXPLANATION OF PLATE LXXII.

Fig. 1, 1 *a*. *Ovulum sinense.*
2, 2 *a*. *Columbella* (*Anachis*) *sinuata.*
Fig. 3, 3 *a*. *Strombus robustus.*
4. *Ampullaria catamarcensis.*
5, 5 *a*. *Triton* (*Epidromus*) *comptus.*

8. Descriptions of five new Species of Birds from Queensland, and of the Egg of *Chlamydodera maculata*. By E. P. Ramsay, C.M.Z.S.

[Received September 19, 1874.]

1. CYPSELUS TERRÆ-REGINÆ, sp. nov.

Whole of the upper surface, except the rump, very dark sooty brown tinged with metallic lustre, being of a darker brown on the outer webs and paler on the inner webs of the wing-feathers; across the rump a greyish white band having a narrow line of dark brown down the shaft of each feather; whole of the under surface dull greyish brown, of a silky texture and somewhat glossy; under surface of wings and tail and the under tail-coverts of a darker tint, the basal half of all the feathers on the body nearly black; bill black; feet blackish brown; iris dark brown.

Total length from 4 to 4·2 inches; bill from the nostril 0·1, from forehead 0·2, from angle of the mouth 0·45; wing from flexure 4·4; tail 2·1 to 2·4; tarsi 0·35.

The sexes of this Swift are alike in plumage and size. The texture of the plumage is remarkably soft, and to the touch resembles the fur of a Bat.

This species frequents the north-east coast ranges near Cardwell, Rockingham Bay, where it is tolerably plentiful, but very difficult to procure, from its small size and swift flight. Small flocks may be seen flying to and fro over the clearer parts of the lower spurs of the coast ranges; and frequently the same troop returns to the same open ground day after day; towards evening others may be found sweeping over the tops of the scrubs and about precipitous sides of the rocky ridges, where they doubtless breed. I found several young or immature-plumaged birds; and none amongst those I obtained had the tail fully grown. I have never seen this species in any other part of Australia than near Rockingham Bay. It was observed in the neighbourhood of Cardwell during October 1873, and when I left in April 1874 was still numerous there. For the first knowledge of this and several other new and rare species I am indebted to Inspector Robert Johnstone, of the police force on the Herbert river near Cardwell, as well as for much valuable information on the natural history of that interesting region.

2. ÆLURŒDUS MACULOSUS, sp. nov.

The whole of the head, including the chin, feathers at the base of the lower mandible, and ear-coverts, black, having a spot of white tinged with olive-green at the end of each feather; the spots on the back of the head and neck become more distinctly tinged with olive-green as they approach the shoulders, where they are lost in the brown-green margin of the feathers, which, on their under surface, are of a bluish green tint.

A narrow line down the centre of each feather on the top of the head and neck black; line over the eye and just in front of it white, tinged with olive-green; lower part of the ear-coverts black; upper part immediately behind the eye centred with white and tinged slightly with olive-green; sides of the lower part of the neck olive-green, each feather indistinctly marked with a white-brown spot.

Whole of the under surface olive-green, being brightest on the flanks, each feather on the chest centred with a conspicuous and somewhat heart-shaped blotch of white, which on the abdomen and flanks becomes lanceolate in form, more acute on the feathers between the flanks and round the vent, which are nearly white, having a brownish crescentic mark near the margin; the spots on the abdomen are almost obsolete. Under tail-coverts olive-green, centred and broadly margined with white tinged with olive-green; the basal portion of all the feathers brown; under surface of the tail brown, with a tinge of bluish green in certain lights; all but the two centre tail-feathers tipped with white on both surfaces; the under surface of the wings, inner webs of primaries, and secondaries dark brown, becoming almost white on the margins of the inner webs. The inner webs of primaries and secondaries, and the basal part of the inner webs of the tertiaries blackish brown on the upper surface; the margin of the wings and under wing-coverts white, with a somewhat crescent-shaped mark of dark brown, margined with green, in the centre; the basal portion of the feathers dark brown. The narrow outer web of the primaries above bluish-green; all the upper surface from the back of neck and mantle bright grass-green; on the tertiaries to approximate secondaries a small spot of white at the tips of the outer webs only; some of the lesser wing-coverts have also a similar spot in certain specimens; and a few of the feathers between the shoulders have a bluish green tinge; two centre tail-feathers and the outer webs of all except the first feather on either side bright grass-green above; the lower portion of the outer web of the first tail-feather on either side tinged with green; the inner webs of all the tail-feathers except the two centre ones blackish brown above, tinged with green near the shafts of the feathers, but becoming blackish brown near the tips, which end in a white marginal spot more largely developed on the inner webs and of greater extent on the outer feathers, diminishing into a narrow white line on those next the centre tail-feathers. Bill light horn-colour.

Total length 10 to 11 inches; bill from forehead 1, from eye 1·9 to 2, from nostril 0·6, from angle of the mouth 1·45, width at base 0·5; wing from flexure 5·5; tail 4·3; tarsi 1·6 to 1·8, of a dark bluish horn-colour. Claws light brown.

The bill is of a pale brown, whilst on the margins and sides it is brownish or yellowish brown, about the base strong and powerful. The feet and legs are blackish horn-brown in the dried skins. The sexes are alike in plumage. Some of my specimens, apparently more adult and in full moult at the time they were shot, have dull brown instead of whitish spots on the black feathers on the head and face: these spots in young birds are washed with olive-green.

This new species is at least one quarter less in size than the New-South-Wales bird, *Æ. smithii*, and is only found on the East-Coast ranges, about Cardwell, at Rockingham Bay. Several specimens were obtained, but unfortunately so late in the season that the plumage was much worn and discoloured. As far as I am aware, their food is exclusively fruit, which may be fonud in abundance in the dense jungles and scrubs which clothe the sides of the ranges.

This species may easily be distinguished from *Æ. smithii* by the black and white markings about the head and face, and the large elongated heart-shaped spots on the under surface.

Its note resembles that of *Æ. smithii*, but is not so distinct a cry, and less bat-like, clearer, and more of a whistle. They assemble in small flocks of from ten to twenty in number, and frequent the palms and native fruit-trees in company with *Ptilonopus superbus* and *Carpophaga assimilis*. They are also found feeding in the immense fig-trees which abound in the scrubs.

3. PTILOTIS FRENATA, nov. sp.

Of this new species, for which I beg leave to propose the name of *P. frenata*, on account of the markings at the base of the bill and round the face, some few individuals were obtained frequenting the Eucalypti while in blossom, near the margin of a swamp in the Cardwell district.

The birds were shot by my (then) collector, Mr. Broadbent, who is already well known as an enthusiastic and careful taxidermist. To Mr. Broadbent's researches my collection is also indebted for the first specimen of *Eopsaltria inornata*.

Description.—Whole of the upper surface dull brown; head, lores, and nape of neck blackish brown, the feathers having indistinct lunulate markings and a gloss of olive in certain lights; a semi-bare space below the eye has a few minute buffy white feathers; behind the eye a semilunar patch of white feathers tipped with black, which, extending in a narrow line, almost encircles that organ. Eye-lashes black; ear-coverts black, above them immediately behind the eye is a small tuft of bright wax-yellow feathers joining a large triangular patch of light greyish brown feathers on the side of the neck, which has the upper portion of it, nearest the ear-coverts, tinged with olive; a narrow indistinct line of yellow on either side bounding the ear-coverts below, extending obliquely to the lower part of the chin, where, meeting in an angle, they form an indistinct yellow patch on the throat. Chin and remainder of the under surface dull brown, slightly darker in tint on the breast and sides of the neck, lighter on the centre of the abdomen and under tail-coverts; across the chest are indistinct wavy lines of a darker tint, on the flanks indistinct lanceolate markings of the same tint. Under surface of the shoulders, inner margins of tertiaries, secondaries, and the basal portions of inner margins of the primaries light buff. The outer webs of the spurious wing-feathers, the tertiaries, and secondaries, with some of the primaries, are on the upper surface tinged with olive. Bill black, with the basal portion (except the culmen) yellow. The gape, with a narrow fleshy appendage, yellow. Feet and tarsi of a dark brown.

Total length 8·5 inches; bill from angle of mouth 1·05 inch, from feathers at the nostrils 0·65, from forehead 1·05, height at nostrils 0·2, breadth 0·2; wing from flexure 4·05; tail 3·6; tarsi 0·35.

Hab. Rockingham Bay.

Sexes alike in plumage. One specimen, said to be a male, is considerably smaller in all its measurements, which are as follows:—Total length 7·5 inches; wing 3·65; tail 3·25; bill from angle of the mouth 0·95, from feathers at nostrils 0·6 inch, from forehead 0·9, height at nostril 0·2, breadth 0·2.

4. EOPSALTRIA (?) INORNATA, nov. sp.

Whole of the head dull slate-brown, paler round the eye, lores darker; lower part of the neck and all the upper surface washed with olive; wings above dark brown, having the margins washed with olive; inner edge of wing light olive-yellow, almost citron-colour. Under wing-coverts white, washed with citron-yellow; inner margins of tertiaries, secondaries, and the basal margins of the primaries whitish; throat greyish white; chest brownish grey, washed with olive on the lower sides; flanks, abdomen, and under tail-coverts citron-yellow; under surface of tail brown, shafts of feathers white; upper surface of the tail slightly darker brown, the exposed portions of the feathers washed with olive. Bill and legs black.

Total length 5½ inches; bill from forehead 0·5, from angle of the mouth 0·65, height at base 0·18, breadth 0·15; wing from flexure 3; tail 2·3; tarsi 0·7.

Hab. Dense scrubs of the N.E. coast of Rockingham Bay and Endeavour river, &c.

5. RHIPIDURA SUPERCILIOSA, nov. sp.

Description (♂).—Head dark slate-colour; a very conspicuous line over the eye; the throat and chin white; the whole of the upper surface dark slate-brown; spurious wing-feathers with a spot of light brown at the tips; upper wing-coverts marked faintly at the tips with white; the tertiaries and secondaries having a whitish line on the outer margin, which, becoming broader at the tips, forms an irregular spot tinged with brown; tail blackish brown above; across the chest a band of slate-brown, a few feathers in the centre of which are striped down the shaft with a narrow lanceolate mark of white. Abdomen and flanks buffy white; under surface of shoulders white, the basal portion of the feathers being dark brown. Under tail-coverts white; under surface of tail dark brown, having the outer feathers on either side tipped to the extent of one third of its entire length with white, which colour extends along the outer web to within one third of the length of the feathers of the base, which is dark brown, the next feather on either side having at the tip an oblong oblique patch of white about ·7 inch in length, the third feather on either side having only a small margined spot of white at the tip of the outer edge. Bill and tarsi black.

Total length 10·5 inches from tip of bill; bill from forehead 0·6, from nostrils 0·3, from angle of mouth 0·75, in width 0·25; bristles black, in length 0·4; wing from flexure 3·2; tail 3·6.

Hab. Margins of scrubs and "opens," Rockingham Bay, Endeavour river, and N.E. coast.

Description of the Egg of Chlamydodera maculata.

In form elongated, tapering; shell thin and delicate, somewhat shining and smooth. Ground-colour of a delicate greenish-white tint, surrounded with narrow, wavy, twisted, irregular, thread-like lines of brown, dark umber, light umber brown, and a few blackish brown, which cross and recross each other, forming an irregular network round the centre and thicker end; towards the thinner end they are not so closely interwoven, and light brown lines appear as if beneath the surface of the shell, also a few black irregular-shaped linear markings, much broader than the rest, show conspicuously against the pale greenish white ground; and here and there, over the whole surface, are scattered ill-shapen figures resembling twos, threes, and fives (2, 3, 5), of various tints of colour.

Length 1·5 inch, breadth 1.

For the first specimen of this rare egg I am indebted to my friend J. B. White, Esq., who procured it at Springsure, some 200 miles inland from the N.E. coast.

November 17, 1874.

George Busk, Esq., F.R.S., Vice-President, in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of October 1874:—

The total number of registered additions to the Society's Menagerie during the month of October 1874 was 69; of which 4 were by birth, 29 by presentation, 24 by purchase, and 12 were received on deposit. The total number of departures during the same period by death and removals was 72.

The most noticeable additions during the month of October were as follows:—

1. A Gentoo Penguin (*Pygosceles tæniatus*) from the Falkland Islands, purchased October 22nd, being the first example of this species of Penguin received alive.
2. A Tooth-billed Pigeon (*Didunculus strigirostris*) from the Samoan Islands, deposited by Mrs. Boddam-Whetham, October 23rd, and subsequently presented to the Society by Mr. J. W. Boddam-Whetham.

The Secretary exhibited the egg referred to by the Rev. S. J. Whitmee, in his communication read March 17, 1874 (see P. Z. S. 1874, p. 184), as that of *Pareudiastes pacificus*, and an accompanying egg of the Samoan *Porphyrio*. In a letter recently received Mr.

Whitmee said, "From further inquiries made respecting this bird, I feel convinced that it burrows, and that it feeds and goes about chiefly at night. It is certain that it was common in Samoa formerly; but those who knew it when it was plentiful, have nearly all died out."

The following communication was read from Sir Victor Brooke, Bart, F.Z.S.:—

"In the P. Z. S. 1872, p. 690, Dr. Sclater identifies a deer living in the Society's Menagerie with *Cervus savannarum* (Cab.), which species is represented in European Museums by one solitary specimen, the type, at Berlin. It appears to me that Dr. Sclater is mistaken in this identification. In the first place the deer in the Society's Gardens is a *very* much larger animal than the true *C. savannarum*, as will be shown by the following measurements taken from the type specimen in Berlin:—

	inches.
Height at shoulder	26½
Length from point of shoulder to the ischial extremity of the haunch	29
Length of face from between the horns to the tip of the nose	7½
Horns (length)	9½

In the true *C. savannarum* there is no sign whatever of the tarsal gland, whereas in the Society's specimen the position of this gland is marked by a very conspicuous white tuft, well shown in Mr. Keuleman's drawing (P. Z. S. 1872, pl. lix.). In this latter specimen the horns bear several long tines on their posterior surface, closely resembling in this respect and in their general character those of *C. virginianus*. In the true *C. savannarum*, as exemplified by the single specimen known, the horns bear only one long tine, which is but very little smaller than the part of the beam anterior to it, thus more approaching *C. macrotis* and *C. columbianus*; small brow-antlers arise from the beams, a little above the burrs, projecting inwards. In colour the Berlin specimen differs considerably from that in the Gardens.

A series of eggs of Megapodes (*Megapodius*) transmitted by Mr. John Brazier, C.M.Z.S., was exhibited and the following notes on them read:—

"I send 24 eggs of a species, or of various species, of Megapode, of which 14 are from Savu or Galera or Russell Island, 1 from Treasury Island, and 9 from New Britain, all islands of the Solomons group. I also send one bird in spirits, which was hatched on board ship August 21, and died Sept. 8, 1872; this bird was from a Savu egg. The natives bring these eggs off for sale to passing ships by the thousand, and at the same time eat the eggs raw. I have eaten the eggs when boiled, but do not much care for them, as they have a raw-potato-like taste and smell about them. When boiled, the thin membrane that covers the albumen is of a lead-colour; but when the yolk and albumen are beat together and made into an omelette, as I have seen our cook do, it is not to be known from the common fowl's egg. At New Britain the natives brought them off also in great quantities, like the Savu natives; in fact one saw the blue jackets eating them all day long or as long as the eggs lasted. There must have been a great many thousands consumed in two days at both islands. At Treasury Island I obtained four, but I broke two in blowing; I send one. I also send a very young bird taken from a New-Britain egg. When at San Christoval I was shown an egg that Perry, a white man living there these last five years, said was laid by the 'Wild Fowl;' and upon my visiting him a few days after, he had just obtained another from the nest of his domestic fowls. He being in bad health at the time, I did not press him to let me have it; and for two days I traversed the mountains with guides to try and obtain specimens of the bird, but without success.

"In 1865 a young Megapode was brought on board the 'Curaçoa' by the natives of Golfe Island (See 'Brenchley's Cruise of the Curaçoa' p. 392, also Brazier, P. Z. S. 1869, p. 528, and Sclater, P. Z. S. 1869, p. 529). Dr. Bennett also gives some notes, P. Z. S. 1862, p. 247, where he alludes to the occurrence of this form in Zanna and Sandwich. I am of opinion that species of *Megapodius* exist upon every island in the Solomons; but, through the kidnapping that has been carried on for some time past, it is far from safe to land upon some of the finest islands in the Pacific."

Mr. Bowdler Sharpe, F.Z.S., exhibited two Megapode's eggs which had been brought from the south-western portion of New Guinea by the Rev. M. Wyatt Gill, B.A. The point where they had been obtained was exactly opposite the Cape-York peninsula of Australia; but unfortunately no birds were procured. The eggs were, in Mr. Sharpe's opinion, referable to species of *Talegalla* and *Megapodius*, the latter being apparently inseparable from eggs of *M. tumulus*; but that of the *Talegalla* appeared to differ from specimens of *T. lathami* and *T. cuvieri*, both of which were represented in the museum series, and, he suspected, would belong to an undescribed species. He declined to found a specific name on an egg; but the occurrence of Megapodes in this unknown portion of New Guinea seemed to be an event of some interest, though not one to be much wondered at.

Mr. St. George Mivart, F.R.S., read a memoir on the axial skeleton of the Struthionidæ, in continuation of a previous memoir on the same subject published in the Society's 'Transactions.'

This paper, which treats of the axial skeleton in *Rhea*, *Dromæus*, *Casuarius*, *Apteryx*, and *Dinornis*, will be likewise published in the Society's 'Transactions.'

The following papers were read:—

Descriptions of five new Species of *Helicidæ* of the Subgenus *Plectopylis*, with remarks on all the other known forms. By Major H. H. Godwin-Austen, F.R.G.S., F.Z.S., &c., Deputy Superintendent, Topographical Survey of India.

[Received September 25, 1874.]

(Plates LXXIII. & LXXIV.)

The new species here described are from a collection of shells made in the Naga Hills and Munipur, when I was employed on the survey of that part of the country, which has proved so rich in Molluscan fauna.

Plectopylis was established as a good and distinct subgenus of the Helicidæ by Mr. W. H. Benson, in the 'Annals & Magazine of Natural History' for April 1860. I have been led to give drawings of all the species I could obtain, in order to better elucidate the interesting change that has taken place in the form of the internal barriers, and which on the examination of many specimens of local species I have found most constant.

Benson's excellent paper leaves very little to be added; but I trust the drawings now given may be useful not only as illustrative of the new species but of his paper and the forms he described, as well as those afterwards collected by Mr. W. T. Blanford, and described by him in the Journ. Asiat. Soc. Beng.*

The subgenus arranged under its principal physiological characters, as given in the table annexed, presents two well-marked divisions, the first of which can be further subdivided into two, and the second into three subgroups.

Helix (Plectopylis) serica, nov. sp. (Plate LXXIII. fig. 5.)

Shell dextral, very openly umbilicated, discoid, pale horny brown, very flat above, with regular narrow oblique bands of brown crossing the whorls. Epidermis thin. The apex very slightly higher than the adjacent and outer whorls. Whorls 7, narrow and closely wound, flat above, the last descending near the aperture, which is diagonal; outer margin circular; peristome white, reflected, continuous on the body-whorl or parietal margin. The palatal teeth, 6 in number, are situated rather more than one third the circumference from the aperture; and, counting from above downwards, the first is very minute, the 4th, 5th, and 6th the largest. On the parietal side of the whorl there is one single vertical lamina with short bifurcations or supports above and below.

Major diam. 0·50 inch, minor diam. 0·43, alt. axis 0·16.

Hab. I first collected this shell on the peak of Henoozdan, Burrail

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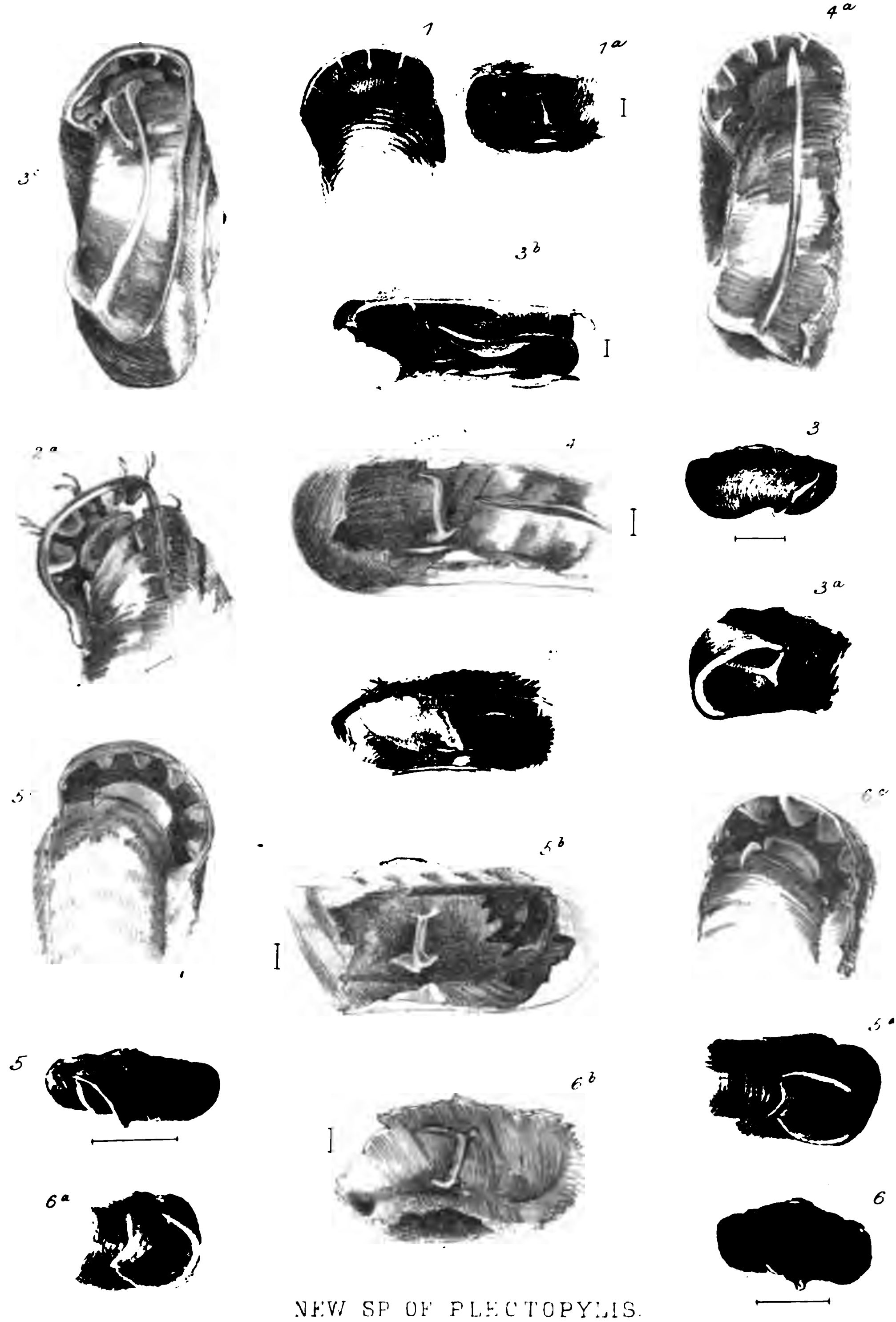
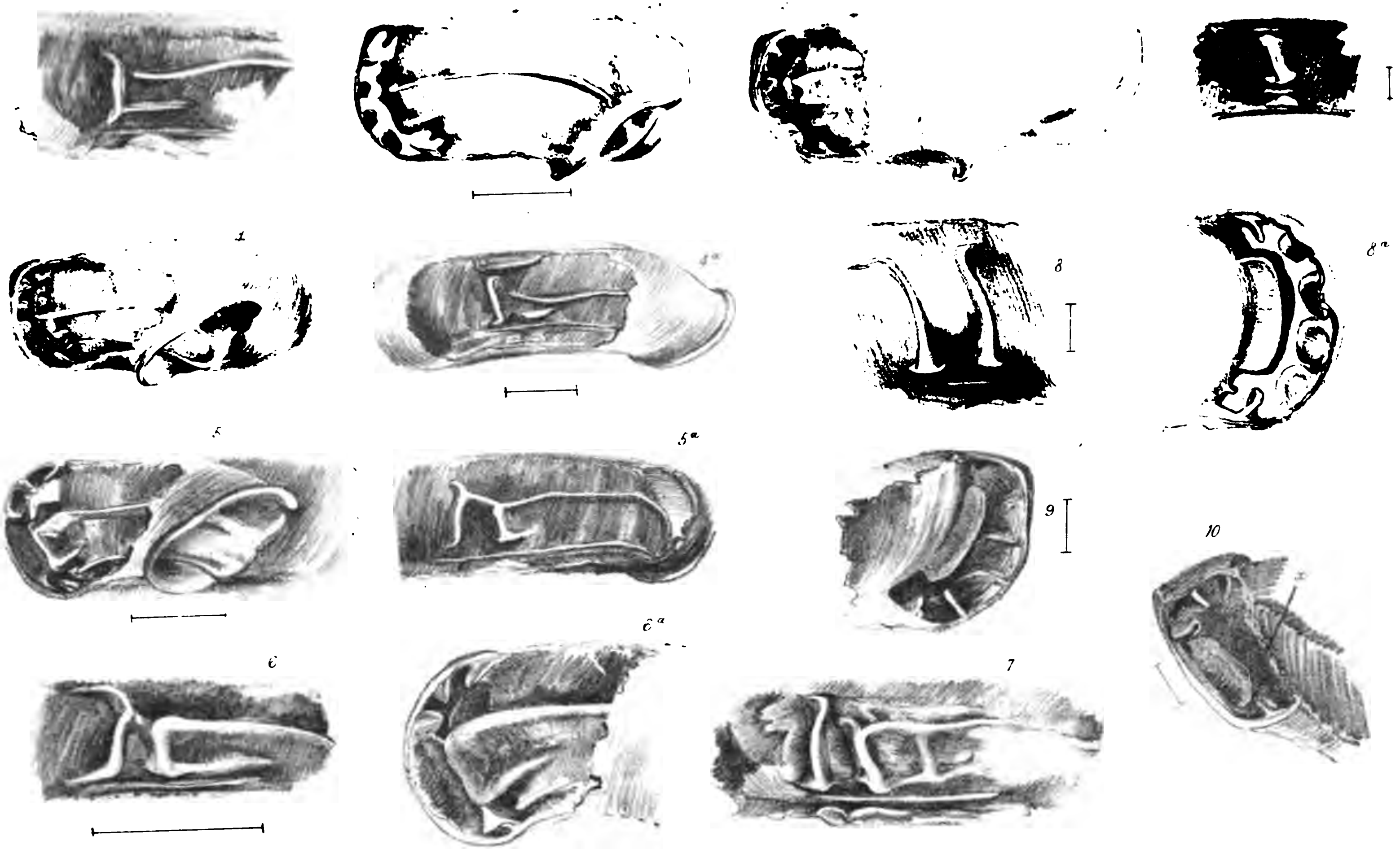
* 'Contributions to Indian Malacology,' No. V. vol. xxxiv. part ii. pp. 8, 9. Vide also notes by same on a species of *Plectopylis*, 'Ann. & Mag. Nat. Hist.' for April 1861, ser. 3, vol. xi. p. 86.



NEW SP. OF PLECTOPYLIS.
N. E. FRONTIER, BENGAL.

Godwin-Austen del.
Maclure & Macdonald, Lith.



NEW SPECIES OF PLECTOPYLIS.

Godwin Austen, Del

Maclure & Macdonald Lith

range, in the spring of 1868. I again found it abundant above 5000 feet on the same range as far east as the Kopamedza ridge. It is essentially a forest species, found in the dead leaves and moss at the foot of the trees.

This species may be known at once by its regular banding, and in fresh shells by the upper very smooth silk-like surface; this, however, in old specimens is not observable, the epidermis becoming more coarsely striated. After opening out several specimens to examine the internal arrangement of the barriers, I found one shell to have two vertical parietal lamellæ, precisely similar in form, a reduplication of structure to which I think is clearly due the more compound forms of the plicæ and lamellæ in the Burmese species.

HELIX (PLECTOPYLIS) SHIROIENSIS, nov. sp. (Plate LXXIII. fig. 3.)

Shell sinistral, openly umbilicated, discoidal, thin, light brown, very finely striated. Apex flatly convex; suture slightly impressed; umbilicus open and deep. Whorls 6, the last rounded, sharply compressed on the lower part behind the aperture and descending to it. Aperture broadly lunate, very oblique; peristome white, continuous, reflected. From the centre of the parietal ridge completing the peristome a lamella runs up that side of the whorl for three sevenths of the circumference towards the parietal plication, but does not join it; and here a short free horizontal lamina lies parallel to and below it. The parietal vertical lamina is simple, with one short support at the lower anterior end; and below this is another, free, narrow, horizontal lamella. Palatal teeth consist of 4, that are horizontal; the 4th is long, narrow, and curving inwards. Between the 3rd and 4th is a vertical double-notched tooth, evidently a compound and representative of two very oblique plicæ.

Major diam. 0·30 inch, minor diam. 0·28, alt. axis 0·15.

Hab. This very distinct species occurred most abundantly on the slopes of the peak of Shiroifurar, N.E. of Munipúr, at an altitude of from 8000 to 9000 feet, and there only in the short grass skirting the edge of the forest that clothed the shady north-east slopes of the ridge. This form has the highest range of any of this subgenus yet collected in this part of India.

In general outward form it is like *H. macromphalus*, W. Blf.; but its nearest local ally is *H. nagaensis*, which has only one single horizontal lamella, and palatal plicæ simple and nearly parallel. It is very interesting to find close allies to this shell in the Burmese forms *H. perarcta* and *H. pseudophis*, Plate LXXIV. figs. 4 and 3. These last two are very similar; but in the former the horizontal lamella is not continuous, and in the latter the vertical barrier is notched.

HELIX (PLECTOPYLIS) NÁGÁENSIS, nov. sp. (Plate LXXIII. fig. 4.)

Shell sinistral, widely umbilicated, discoid, dull ochry brown, epidermis thick and coarsely striate; above depressedly pyramidal. Whorls 7, flat, narrow, and those near apex closely wound, the last very descending near mouth. Aperture diagonal, broadly lunular, outer margin well rounded, peristome very thick, white, reflected. A thick ridge on the parietal side, separated by slight indentations, connects the inner margins; and from the middle of this runs back a long horizontal lamella, terminating close to, but not connected with the single vertical lamina; this is thick and bifurcate below, tapering above and curving backwards; a short free lamella is situated immediately under it. Palatal plicæ 6, horizontal, the first and upper small, the remainder about equal in size.

Major diam. 0·48 inch, minor diam. 0·42, alt. axis 0·23.

Hab. Prowi, head of the Lauier river, Nágá hills, 5000 feet.

Young shells have only a portion of the long lamella developed just in front of the vertical one. A dwarfed variety of this species occurred at Sikhámi, on the lowest part of the main watershed of the Burrail, measuring only, major diam. 0·30 inch, minor diam. 0·27. alt. axis 0·12.

In the Nágá Hills, besides these new forms, I also obtained *P. macromphalus* at the head of the Ihang; but it was not at all abundant.

HELIX (PLECTOPYLIS) MUNIPURENSIS, nov. sp. (Plate LXXIII. fig. 6.)

Shell dextral, openly umbilicated, tumidly discoid, thick, pale ochry brown, with distant spots of colour on the upper surface. Umbilicus open and deep. Spire very depressedly conoid, suture shallow. Whorls 7, flat, the last narrowly constricted just behind the aperture and descending very slightly. At the upper and outer margin of the aperture is a slight compression giving a waved outline to the lip. Aperture very oblique, semicircular, peristome slightly reflected, white, a low, narrow, curvilinear ridge joining the margins. The parietal vertical lamina is situated one third of the circumference from the mouth, having an attached anterior short horizontal process equal to its length; short supports on the posterior extremity and curving slightly forwards on the lower. Palatal teeth 7, the first and upper minute, the second, third, fourth, and fifth horizontal, the second being the longest, sixth minute, seventh rather lengthened, horizontal, backed by a single isolated small tooth.

Major diam. 0·44 inch, minor diam. 0·40, alt. axis 0·21.

Hab. At the end of the Ihang valley, Munipúr, at about 3000–4000 feet, apparently rare; only seven specimens were obtained. It is a dextral form of the very common *Plectostoma*, but is more depressed in form, more widely umbilicated, and does not possess the hairy epidermis of that species.

HELIX (PLECTOPYLIS) PSEUDOPHIS, W. Blf. MS. (Plate LXXIV. fig. 3.)

Shell sinistral, widely umbilicated, discoid, rather thin, pale ochre. Spire quite flat or very flatly convex, suture shallow. Whorls 7, the last well rounded below, less so above, constricted behind the aperture and descending sharply. Aperture very oblique, oblately circucular; peristome reflected all round, margins connected by a curved ridge, with slight notches both above and below. A long horizontal lamella is given off from centre of the apertural ridge and extends up to, but does not unite with the vertical parietal lamina; this is simple, toothed on the vertical edge, curving above slightly backwards, and giving off a short horizontal lamella from the lower end towards the aperture; a thread-like free lamina, rather longer, runs parallel to it below. Palatal teeth simple, 6 in number, the three lowest the longest and highest, the sixth much arched outwards.

Major diam. 0·50 inch, minor diam. 0·43, alt. axis 0·19.

Hab. Discovered by Mr. W. T. Blanford at Thayatmyo, in Pegu, who has kindly allowed me to describe it.

This well-marked species is a close link to *P. perarcta*; but the lowest free lamella does not extend up to the aperture to unite there with the parietal ridge as in that shell. The vertical parietal lamina is remarkably toothed in all the shells I have examined, and the principal long horizontal lamella is unbroken throughout.

I have before alluded to an occasional reduplication of structure when describing *Plectopylis serica*, which reduplication seems to have played an important part in the development of the different species, such a change becoming at last permanently established. This is apparent on an examination of the species from north to south, those from Burmah showing a structure more complicated and with internal barriers more solid. The Himalayan, Khási, and North-Burma forms are the simplest*, while in *P. cyclaspis, karenorum, achatina,* and *feddeni* they have assumed the most complicated form.

In *P. feddeni* the parietal barrier is evidently a combination of three parallel vertical laminæ, the two anterior of which are first united above and below by horizontal lamellæ, the enclosed area becoming eventually filled with shelly matter. At the same time, in these last species the tendency that is seen in many species to obliquity in the normal horizontal parallel palatal plicæ has at last produced, as the representative of the fourth and fifth plicæ, one solid and nearly vertical lamina, situated immediately in front of the interval between the vertical parietal laminæ.

It seems difficult to account for the use of the extremely contracted internal form of the last whorl, as seen so largely and intricately developed in this group of the Helicidæ.

When breaking up a number of shells to expose the barriers, and ascertain if their characters were constant, I was greatly interested to find in two instances the presence of small insects that had become fixed between the sets of teeth; it has occurred to me that this is a probable solution, and perhaps one of the uses which the barriers serve, and to this end have been developed.

Insect life swarms in the forests where the shells are found; and it is quite possible that certain kinds of beetles, ants, or even leeches, prey upon the mollusca, and that those possessing such bars to their predatory visits, supplemented by the mucous secretion which the animal could at once exude, would have the best chance of surviving.

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* The two small forms from South India and Ceylon assimilate to these, but differ in the arrangement of the palatal plicæ.

Among the species of *Plectopylis* at the British Museum is one labelled *H. prodigium*, Bs. (Mus. Cuming); this is undoubtedly *H. plectostoma*, Bs., the former being very likely its first MS. name. *Plectopylis refuga*, Gd., var. *dextrorsa*, I have not been able to examine; but it probably will prove distinct.

P. pettos, described (as *Corilla*) by Dr. Ed. v. Martens, Malakozoologische Blätter, 1868, p. 158, together with other shells from the Himalayas, it is difficult to place in its true position in the genus, owing to the internal structure having been left unnoticed. It would appear to be very close in form of aperture to *P. serica*. I know of no similar form from the Himalaya that would agree with the description. *H. pulvinaris*, Gould, from Hongkong, to which it is said to approach, is not known to me.

I have been able to examine, by the kindness of Dr. Günther, all the species of the genus in the British Museum, among them *P. refuga*, Gld. This is sinistrose. Whorls 6, with one long horizontal parietal lamella, continuous to the apertural ridge, with two free horizontal lamellæ below it, the lowest being the longest, and situated close to the simple vertical barrier; below this is another moderately long horizontal free lamina. The palatal plicæ are 6, the four upper lengthened; the fifth is subvertical, and the sixth small. *P. refuga* is very close to *P. leiophis*; but in that species the long upper horizontal lamella is united to the second and shorter one below.

Characters of the Genus Plectopylis.

[All these forms have a lower parietal free lamella, with the exception of those marked †.]

Group A. Parietal vertical lamina *simple*.
a. Horizontal parietal lamina *none*.
α. Palatal plicæ simple.
1. *serica*†, G.-A. D. N.E. frontier, Nágá Hills.
2. *pinacis*, Bs. S. E. Himalaya.
3. *munipurensis*, G.-A. D. N.E. frontier, Bengal.
4. *laomontana*†, Pfr. D. Cambodia, Lao Mt.
laomontana, small var. Cambodia.
pettos, v. Martens? Himalaya?
β. Palatal plicæ double, in two rows.
5. *macromphalus*, W. Blf. S. Darjeeling and N.E. frontier, Bengal. Khási.
6. *plectostoma*†, Bs. S., epiderm hirsute. Darjeeling and N.E. frontier, Bengal. Khási.
* United by low ridge.
7. *andersoni*†, W. Blf. D. N. Burmah.
** Posterior row strong, oblique.
8. *clathratula*†. D. Kandy, Ceylon.
*** Posterior row strong, vertical.
9. *retifera*†. D. Southern India.
b. Horizontal parietal lamina *present*.
* Single.
10. *nagaensis*, G.-A. S. N.E. frontier, Nágá.

** One additional, shorter.
11. *pseudophis*, W. Blf. MS. S. Pegu.
12. *perarcta*[‡], W. Blf. S. Ava, Burmah.

Group B. Parietal or palatal barriers *compound*.
a. *Parietal* vertical lamina only *compound*, and palatal plicæ simple.
a. Horizontal parietal lamina present.
* Very short.
13. *brachyplecta*[†][§], Bs. D. S. Burmah.
** One additional.
14. *feddeni*, W. Blf. S. Pegu. Prome.
b. *Palatal* vertical plicæ only *compound*.
a. Horizontal parietal lamina present.
* One additional.
15. *shiroiensis*, G.-A. S. N.E. frontier, Munipúr.
** Two additional.
17. *leiophis*, Bs. S. S. Burmah, Pegu.
17. *refuga*, Gld. S. S. Burmah,
18. *refuga*, var. *dextrorsa*? D. S. Burmah.
c. *Both* parietal and palatal processes *compound*.
a. Horizontal parietal lamina present.
* Single.
19. *karenorum*[‡], W. Blf. S. Pegu.
20. *cyclaspis*, Bs. S., keeled. Tenasserim. S. Burmah.
** One additional.
21. *achatina*, Gray. S. =*repercussa*, Gld. Tenasserim. S. Burmah.
22. *anguina*[§], Gld. S. S. Burmah.

EXPLANATION OF THE PLATES.

Plate LXXIII.

Fig. 1. *Plectopylis macromphalus*, W. Blf., tangential side view seen from the front or side of the aperture; portion of the last whorl removed.
1 *a*. Direct side view; outer side of whorl and palatal plicæ removed.
2, 2 *a*. *Plectopylis plectostoma*, Bs., similar diagrams
3, 3 *a*, 3 *b*, and 3 *c*. *P. shiroiensis*, G.-A.
4, 4 *a*. *P. nagaensis*, G.-A.
5, 5 *a*, 5 *b*, 5 *c*. *P. serica*, G.-A.
6, 6 *a*, 6 *b*, 6 *c*. *P. munipurensis*, G.-A.

Plate LXXIV.

Fig. 1. *Plectopylis pinacis*, Bs.
2. *P. leiophis*, Bs.
3, 3 *a*. *P. pseudophis*, W. Blf., MS.
4, 4 *a*. *P. perarcta*, W. Blf.
5, 5 *a*. *P. karenorum*, W. Blf.

Fig. 6, 6 *a*. *P. achatina*, Gray.
7. *P. feddeni*, W. Blf.
8, 8 *a*. *P. brachyplecta*, Bs.
9. *P. andersoni*, W. Blf.

10. *P. cyclaspis*, Bs.: *x*, the parietal plication, removed to show the palatal plicæ.

Note.—The horizontal dimensions given in this plate are, in every case, the major diameter of shell, the vertical the breadth of whorl.

[‡] In *P. perarcta* and *P. karenorum* it is continuous to the aperture, and in *P. munipurensis* is aberrant.

[§] The horizontal parietal lamina in *P. anguina* extends not quite up to the bar at the aperture, and is very thin; in *P. brachyplecta* it only extends to half the distance.

2. A Study of the Larks of Southern Africa. By R. Bowdler Sharpe, F.L.S., F.Z.S., Senior Assistant, Zoological Department, British Museum.

[Received October 6, 1874.]

(Plates LXXV. & LXXVI.)

Having lately had occasion to revise some of the families of birds for a new edition of Layard's 'Birds of South Africa,' I found that few presented such difficulties as the *Alaudidæ*. South Africa is the home of the Larks, possessing no less than nine genera and twenty-two species; but the greatest confusion exists with regard to the latter, and it has been the object of the present paper to reduce them to order. The superabundance of species has arisen in a great measure through the fact of most of the Larks of South Africa having a very distinct winter plumage, which has been regarded as specifically distinct; while at the same time I believe that there are not present in South Africa European genera such as *Alauda* &c. The following table of genera has been compiled with a special view to determining the South-African genera, certain European and Asiatic forms being placed in order to indicate their affinities; but, from want of perfect specimens in some instances, I have no doubt that modifications may be expected in the Asiatic genera. My main object, however, has been to elucidate the characters of such forms as come within the limits of the present essay. I have to return my thanks to Canon Tristram, Captain Shelley, Mr. T. E. Buckley, and Mr. J. H. Gurney for the loan of specimens. In addition to their collections, the basis of this essay rests upon the series in my own cabinet and that of the British Museum, whither my own collection will shortly be removed.

Key to the Genera.

a. Culmen longer than, or equal to, the middle toe and claw.
a′. First primary long, about equal to, or a little longer than, the tarsus.
a″. Hind claw long and perfectly straight .... 1. *Certhilauda*.
b″. Hind claw rather short and curved.
a‴. Bill long and slender, measuring from gape to tip about the same as the tarsus .... 2. *Alæmon*.
b‴. Bill short and stout, much shorter than tarsus when measured as above.
a^4. Nostrils uncovered .... 3. *Heterocorys*.
b^4. Nostrils hidden by bristles .... 4. *Ammomanes*.
b′. First primary rudimentary, shorter than tarsus ...... 5. *Alaudula*.
c′. First primary feebly developed, not equal to half the tarsus. 6. *Rhamphocorys*.
b. Culmen shorter than middle toe and claw.
d′. No lateral elongated tufts on the head.
c″ Crest-feathers shorter than tarsus.
c‴. First primary rudimentary, shorter than inner toe and claw.
c^4. Distance between tips of primaries and tips of secondaries less than tarsus.

c^5. Distance between tips of primaries and secondaries much more than length of hind claw.
  a^6. Bill comparatively short and slender; wing falling short of tail by more than length of tarsus ...... 7. *Alauda*.
  b^6. Bill short and conical; wings long, falling short of tail by less than length of tarsus .... 8. *Calandrella*.
d^5. Distance between tips of primaries and secondaries not more than length of hind claw.
  c^6. Bill higher than broad........................ 9. *Spizocorys*.
  d^6. Bill equal in breadth and height .... 10. *Tephrocorys*.
d^4. Distance between tips of primaries and tips of secondaries equal to tarsus.. 11. *Melanocorypha*.
e^4. Distance between tips of primaries and tips of secondaries much greater than tarsus .... 12. *Pallasia*.
d''. First primary well developed, longer than inner toe and claw.
  f^4. Nostrils covered with stiff bristly plumes.
    e^5. Bill slender, about as broad as high at the nostrils.
      e^6. Third primary longest; crest full and rounded. 13. *Lullula*.
      f^6. Fourth primary longest; crest elongated and pointed. 14. *Galerita*.
      g^6. Second primary longest; no crest......... 15. *Pyrrhulauda*.
    f^5. Bill very stout, much deeper than broad ... 16. *Calendula*.
  g^4. Nostrils exposed, with superior membrane ... 17. *Mirafra*.
d''. Crest-feathers longer than tarsus .... 18. *Spizalauda*.
e' Sides of head with conspicuous elongated hornlets...... 19. *Otocorys*.

Genus 1. CERTHILAUDA.

	Type.
Certhilauda, Swains. Zool. Journ. iii. p. 344 (1827).	*C. capensis*.
Thinotretis, Gloger, Handb. Naturg. p. 266 (1842).	*C. capensis*.
Chersomanes, Cab. Mus. Hein. i. p. 126 (1850) ..	*C. garrula*.

Key to the Species.

a Tail not tipped with white spots .... *capensis*.
b. Tail tipped with large white spots.
  a'. General colour rufous, with narrow dark brown centres to the feathers; secondaries rufous, with fulvous margins .... *rufula*.
  b'. General colour dark brown, with slight shade of rufous on margins of feathers; secondaries ashy brown, with very narrow whitish or rufous margins .... *garrula*.

1. CERTHILAUDA CAPENSIS.

Le Sirli du Cap de Bonne Espérance, Buff. Pl. Enl. 712.

Alauda capensis, Bodd. Tabl. Pl. Enl. p. 45 (1783, *ex Buff.*).

African Lark, Lath. Gen. Syn. ii. pt. 2, p. 389 (1783).

Alauda africana, Gm. S. N. i. p. 798 (1788, *ex Buff.*); Vieill. Gal. Ois. ii. pl. clix. (1825); Giebel, Thes. Orn. p. 290 (1872).

L'Alouette Sirli, Levaill. Ois. d'Afr. iv. pl. 192 (1805); Sund. Crit. om Lev. p. 46 (1857).

Certhilauda longirostris, Sw. Classif. B. ii. p. 293 (1837).

Certhilauda africana, Gray, Gen. B. ii. p. 383 (1844); Smith, Ill. Zool. S. Afr. pl. xc. fig. 1 (1849); Bp. Consp. i. p. 246 (1850); Gurney, Ibis, 1860, p. 208; Layard, B. S. Afr. p. 217 (1867); Sharpe, Cat. Afr. B. p. 71 (1871).

Chersomanes africana, Cab. Mus. Hein. Th. i. p. 126 (1850).
Alæmon africana, Licht. Nomencl. Av. p. 39 (1854).
Certhilauda capensis, Gray, Handl. B. ii. p. 120 (1870).

Adult. Above brown, slightly washed with sandy colour and streaked with dark brown centres to the feathers, many of which are tipped with whitish; hind neck greyish; wing-coverts darker brown, washed with sandy colour on the outer web, and tipped with whitish, the primary coverts narrowly tipped with the latter colour also; quills ashy brown, narrowly margined with sandy buff, the innermost secondaries with a broad whitish margin; rump and upper tail-coverts sandy rufous, with dark brown central streaks to the feathers; upper tail-coverts ashy brown, darker brown in the centre of the feathers; tail-feathers dark brown, narrowly margined with ashy fulvous, the two middle ones washed with greyish, the outermost margined and tipped with pale sandy buff; a very distinct eyebrow creamy white; feathers under the eye dusky white, those in front of the latter blackish; ear-coverts dull sandy colour; cheeks whitish, minutely spotted with black; chin white; rest of under surface buffy white, the breast slightly washed with sandy colour, the lower throat, fore neck, and breast plentifully marked with triangular spots of black, larger and more longitudinal on the lower breast and sides of the body; sides of the upper breast shaded with ashy; under wing-coverts sandy buff, the outermost minutely spotted with dark brown, the lower series ashy brown, like the inner lining of the wing, the inner webs being pale rufous near the base; under tail-coverts white, broadly streaked down the centre with black; "bill yellowish brown, shaded with umber-brown; legs and toes clear buff-orange, tinted with flesh-red; claws yellowish brown, shaded with umber-brown; iris dark brown" (*Sir A. Smith*). Total length 7·4 inches; culmen 1·05, wing 3·9, tail 3·0, tarsus 1·15.

Female. Coloured like the male (*Sir A. Smith*).

Hab. South Africa: "common in most parts of the colony" (*Layard*); Natal (*Ayres*).

Specimens examined.

E mus. R. B. S.:—*a*, ad. S. Africa (*E. L. Layard*). *b*, *c*. George, S. Africa (*H. Atmore*).

E mus. H. B. Tristram:—*a*. South Africa (*E. L. Layard*).

2. CERTHILAUDA GARRULA.

Certhilauda garrula, Smith, Ill. Zool. S. Afr. pl. cvi. fig. 1 (1849); Bp. Consp. i. p. 246 (1850); Layard, B. S. Afr. p. 216 (1867); Gray, Hand-l. B. ii. p. 121 (1870).
Chersomanes garrula, Cab. Mus. Hein. Th. i. p. 126 (1850).
Alauda garrula, Giebel, Thes. Orn. i. p. 296 (1872).

Adult male (type of species). Above very dark brown, with narrow margins of sandy fulvous, the hind neck inclining to ashy grey, the head rather darker than the back, and slightly streaked with rufous, the margins to the feathers being of this colour; wing-coverts dark brown, with sandy fulvous margins, the greater series paler brown, some of the coverts slightly margined with white; quills paler brown, margined with ashy fulvous and tipped with white, the secondaries washed on the outer web with ashy grey, and with rufous on the inner web, and tinged with the same at the tip, the lower surface of the wing ashy brown, the rufous margins very distinct on the inner secondaries; upper tail-coverts bright rufous, some of them margined with whitish; tail-feathers dark brown tipped with white, and rufous at the base, like the upper tail-coverts, this colour extending further on the centre feathers, which are shaded with ashy but not tipped with white; forehead tinged with rufous; ear-coverts and a streak above them bright rufous, but not forming a distinct eyebrow; lores buffy whitish; cheeks and throat white, the former with a few specks of brown; rest of under surface bright sandy rufous; the under wing-coverts light isabelline, those on the outer edge of the wing more rufous; on the breast a few spots of dark brown, and on the sides of the upper breast a few streaks of the same: "upper mandible of the bill and the lower towards the point reddish brown, the latter towards the base reddish yellow lightened with flesh-red; legs and toes intermediate between Dutch orange and sienna-yellow, and tinted with flesh-red; claws of the same colour as the legs, shaded with brown; eyes a bright clear brown" (*Sir A. Smith*). Total length 6·7 inches, culmen 0·9, wing 3·7, tail 2·6, tarsus 1·35.

Adult female. Similar to the male, but much smaller, and having a shorter bill. Total length 5 inches, culmen 0·7, wing 3·25, tail 2·1, tarsus 1·1.

Young. Very like the adult, and of the same dark brown colour, but distinguished by very distinct white edgings to the dorsal feathers, wing-coverts, and secondary quill-feathers.

In my 'Catalogue of African Birds,' I united all the small *Certhilaudæ* of South Africa under one name, *C. rufula*; but I believe now that this determination was erroneous, and that there are two species, one a rufous and one a dark brown species. I have what appears to be a good series of each of them in all plumages, and consider them distinct, the following being the measurements of the series.

	Total length. in.	culm. in.	wing. in.	tarsus. in.
1. ♂ ad., S. Africa (*Sir A. Smith*)! ..	6·7	0·9	3·7	1·35
2. ♀ ad. „ „ ..	5·0	0·7	3·25	1·1
3. ♂ ad. „ ..	6·3	0·9	3·4	1·25
4. ♂ ad., Port Elizabeth (*Ortlepp*) ..	6·0	0·8	3·3	1·1
5. ♂ ad. „ „ ..	6·4	0·9	3·5	1·2
6. ♂ ad., Colesberg „ ..	6·1	0·85	3·6	1·1
7. ♀ juv., Natal (*Wahlbery*) ..	5·0	0·65	3·0	1·0

Compared with *C. rufula*, the measurements are as follows:—

	Wing. in.	Culm. in.	Tarsus. in.
C. rufula ♂	3·2–3·5	0·55	1·0–1·1
C. garrula ♂	3·3–3·7	0·8–0·9	1·1–1·35
C. rufula ♀	3·0–3·25	0·7–0·75	1·0
C. garrula ♀	3·0–3·25	0·65–0·7	1·0–1·1

The measurements of the two species, therefore, are not so very different, and they can only be separated by the colour. This seems to be very constant; and as I have the species before me in all plumages, I [illegible] the distinctness of these two Larks.

Hab. "The northern parts of the colony" (*Smith*); Colesberg (*Ortlepp*); Port Elizabeth (*Ortlepp*); Natal (*Wahlberg*).

Specimens examined.

a. ♂ ad. South Africa (*Sir A. Smith*, type of species). *b.* ♀ ad. South Africa (*Sir A. Smith*). *c.* ♂ ad. South Africa.

E mus. R. B. S.—*a.* ♂ ad. Colesberg (*Ortlepp*). *b, c.* ♂. Port Elizabeth, June 5 and August 30, 1869 (*Ortlepp*). *d.* ♂ ad. Interior of Natal, May 3, 1842 (*Wahlberg*).

3. CERTHILAUDA RUFULA.

Anthus rufulus, Vieill. N. Dict. xxvi. p. 494 (1818); id. Gal. Ois. i. pl. clxi. (1825); Bp. C. R. xxxviii. p. 65 (1854).

Certhilauda cinnamomea, Lafr. Mag. de Zool. 1836, Ois. pl. 58; Gray, Gen. B. ii. p. 383 (1844).

Alaemon cinnamomea, Licht. Nomencl. p. 39 (1854).

Certhilauda garrula, Ayres, Ibis, 1869, p. 295 et 1871, p. 268.

Certhilauda rufula, Sharpe, Cat. Afr. B. p. 71 (1871); Gurney in Andersson, B. Damara Ld. p. 200 (1872).

Adult male. Above bright sandy rufous, with narrow and indistinct brown centres to the feathers, many of which are also margined with buffy white in a more or less conspicuous manner; the head of the same rufous as the back, with slight fulvous margins and small dark brown centres to the feathers; lores and a very indistinct eyebrow buffy white; ear-coverts uniform bright sandy rufous; cheeks buffy white, with a few tiny spots of brown; quills sandy brown, with white margins to the feathers, which are all dark brown in the centre, the greater coverts externally inclining to greyish; quills ashy brown, the primaries tipped with whitish, the secondaries darker, externally margined with sandy rufous inclining to buffy white towards the tips of the feathers; rump and upper tail-coverts nearly uniform rufous, the long plumes of the latter dark brown in the centre and narrowly tipped with whitish; tail blackish, with a large spot of white at the tip of all the feathers except the two centre ones, which are rufous, more or less marked down the centre with greyish brown, all the feathers more or less rufous towards the base, this colour sometimes extending for half the feather; the external rectrix narrowly margined on the outer web with buffy white; throat entirely white; rest of under surface of body bright sandy rufous, with a few more or less distinct white margins to some of the feathers; the breast minutely spotted with dark brown; under wing-coverts pale sandy rufous, those on the edge of the wing slightly mottled with brown; "iris hazel" (*Atmore*).

Total length 6·1 inches, culmen 0·85, wing 3·7, tail 2·6, tarsus 1·15.

Adult female. Similar to the male in colour, but smaller, and having a much shorter bill.

Total length 5·5 inches, culmen 0·75, wing 3·5, tail 2·1, tarsus 1·05.

Young. The young bird is principally distinguished by its spotted plumage, the white margins to the feathers of the upper surface being rather spots than terminal margins, and further discriminated by small subterminal black spots. Around the hind neck is a distinct shade of fulvous, almost forming a collar and much plainer than in the adult bird; the margins to the wing-coverts very broadly and distinctly white; throat, lores, and a scarcely perceptible superciliary line white; rest of under surface pale sandy rufous, becoming gradually more fulvous on the abdomen; the breast slightly spotted with pale brown, the feathers margined with whitish.

In winter the young bird is very different, having very broad circular margins of white to all the feathers of the upper surface, with obscure brown central streaks, the under surface very pale and with scarcely any perceptible brown spots on the breast.

What I consider to be the winter plumage of this species is represented by two Damara specimens in my collection. These birds are very pale sandy colour, narrowly streaked with dark brown shaft-lines; throat white; rest of under surface pale sandy isabelline, with only the faintest trace of eight brown spots on the breast.

This is a species which varies much in size, as will be seen by the following measurements.

	Total length. in.	bill. in.	wing. in.	tarsus. in.
1. ♂ ad., Hope Town (*Atmore*)	6·2	0·85	3·5	1·05
2. ♂ ad., Great Namaqua Land (*Andersson*)	6·1	0·85	3·45	1·0
3. ♂ juv. (winter), Wilson's Fountain (*Andersson*)	5·9	0·9	3·5	1·1
4. ♀ ad. (winter), Damara Land (*Andersson*)	4·6	0·75	3·0	1·0
5. ♂ ad. (winter), Damara Land (*Andersson*)	5·7	0·85	3·3	1·05
6. ♀ juv., Great Namaqua Land (*Andersson*)	5·6	0·7	3·25	1·0

It will be noticed by the list of localities that it also seems to have a more northern range than *C. garrula*, though it probably meets that species in the eastern districts of South Africa, as also at Colesberg;

but whereas the present bird appears to be not unplentiful in Damara Land, *C. garrula* was not met with there by Andersson.

Hab. Colesberg (*Ortlepp*); Griqua Land (*Atmore*); Transvaal (*Ayres*); Damara Land (*Andersson*).

Specimens examined.

E *mus. Brit*:—*a*, juv. South Africa (*Sir A. Smith*). *b*, *c*, ♂ ad., ♀ juv. Kami's River, Great Namaqua Land, May 20, 1862 (*C. J. Andersson*).

E *mus. R. B. S.*:—*a*, *b*, ♀ ad. Colesberg (*Ortlepp*). *c*, ♂ ad. Hope Town (*T. C. Atmore*). *d*, ♀ juv. Kami's River, May 20, 1862 (*C. J. Andersson*). *d*, ♂ juv. Wilson's Fountain, May, 29, 1872 (*C. J. A.*). *e*, *f*, ♂ ♀ ad. Damara Land (*C. J. A.*)

E *mus. H. B. Tristram*:—*a*, *b*, ♂. Transvaal (*Ayres*). *c*, ♀ ad. Transvaal, May 1870 (*Ayres*).

Genus 2. ALÆMON.

	Type.
Alæmon, Keys. & Blas. Wirb. Eur. p. xxxvi (1840)	*A. desertorum*.
Calendulauda, Blyth, J. A. S. B. xxiv. p. 258 (1855)	*A. nivosa*.

The type of this genus is the well-known Desert- or Bifasciated Lark. It differs from the true *Certhilauda* of Southern Africa in its short hind claw, which is curved.

Key to the Species.

a. Larger; under wing-coverts isabelline, as well as the inner web of the quills at base .... 4. *semitorquata*.
b. Smaller; under wing-coverts ashy brown, as also the inner lining of the wings .... 5. *nivosa*.

4. ALÆMON SEMITORQUATA.

Certhilauda semitorquata, Smith, Rep. S. Afr. Exp. p. 47 (1836); Gray, Gen. B. ii. p. 383 (1844); Smith, Ill. Zool. S. Afr. pl. 106, fig. 2 (1849); Bp. Consp. i. p. 246 (1850); Mont. P. Z. S. 1865, p. 94; Layard, B. S. Afr. p. 216 (1867); Gray, Hand-l. B. ii. p. 120 (1870); Sharpe, Cat. Afr. B. p. 71 (1871); Gurney, in Andersson, B. Dam. Ld. p. 201 (1871); Buckley, Ibis, 1874, p. 383.

Certhilauda rufopalliata, Lafr. Mag. de Zool. 1836, Ois. pl. 59; Gray, Gen. B. ii. p. 383 (1844).

Certhilauda subcoronata, Smith, Ill. Zool. S. Afr. pl. 90. fig. 2 (1849); Bp. Consp. i. p. 246 (1850); Scl. P. Z. S. 1866, p. 23; Layard, B. S. Afr. p. 217 (1867); Gray, Hand-l. B. ii. p. 121 (1870).

Chersomanes subcoronata, Cab. Mus. Hein. Th. i. p. 126 (1850).

Alæmon rufopalliata, Licht. Nomencl. p. 39 (1854).

Certhilauda coronata, Layard, Ibis, 1869, p. 371.

Alauda semitorquata, Giebel, Thes. Orn. p. 300 (1872).

Alauda subcoronata, Giebel, Thes. Orn. p. 301 (1872).

Adult female in summer plumage. Above clear vinous brown, the head slightly darker, the hind-neck somewhat tinged with ashy grey;

all the feathers of the upper surface distinctly streaked with blackish centres to the feathers, a little less plainly pronounced on the upper tail-coverts, but very distinctly on the upper wing-coverts; greater wing-coverts brown at base, broadly margined with rufous, rather lighter and more fulvescent than the back; primary coverts and quills ashy brown narrowly margined with rufous, the secondaries very broadly bordered, and the centres to these feathers shaded with clear grey; tail-feathers brown, narrowly margined with pale rufous, the centre ones shaded with grey, the outermost feather rather more broadly bordered than the other feathers, especially at the tip; from the nostril a distinct eyebrow, buffy white; lores also buffy white, slightly mottled with blackish; ear-coverts light rufous; cheeks and throat white, with a few scattered spots and tiny bars of black; rest of under surface isabelline fulvous, the flanks tinged with vinous; the breast broadly and distinctly streaked with black, becoming more obscure on the sides of the body and flanks, the under tail-coverts rather more rufescent, with dark brown centres to the feathers; under wing-coverts pale isabelline, excepting the small plumes near the edge of the wing, which are brown, with broad whitish edgings; inner lining of wing ashy brown, tinged with isabelline near base of inner web; "bill pale sienna-yellow, tinged with flesh-red, the upper mandible towards its base and its point shaded with pale reddish-brown; legs and toes pale sienna-yellow, tinted with flesh-red; claws brownish red; iris brown" (*Sir A. Smith*).

Total length 7·5 inches, culmen 0·8, wing 3·65, tail 3·35, tarsus 1·05.

The description is taken from a specimen collected by Mr. T. C. Atmore at Hope Town, which seems to be in full plumage. I have before me three other sexed females, of which I give the principal measurements:—

	Long tot. in.	culm. in.	al. in.	caud. in.	tars. in.
1. ♀, Hope Town (*T. C. Atmore*)..	7·3	0·75	3·75	3·2	1·05
2. ♀, Griqualand (*T. C. Atmore*)..	6·9	0·8	3·75	3·2	1·0
3. ♀, Objimbinque (*C. J. Andersson*)	6 9	0·8	3·7	3·05	1·1

The above measurements are sufficient to show how worthless are the small differences in size of bill and tarsus where Larks are concerned. The last specimen measured is in winter plumage; and this differs so much from the summer dress as almost to appear to belong to another species. It is much paler and more mealy than the plumage described; and the characters of the two seasonal dresses may thus be illustrated in a tabular form.

Female (summer).	*Female* (winter).
Upper surface clear vinous brown, with distinct black stripes.	*Upper surface* sandy isabelline, with fulvous margins to most of the dorsal feathers; head and interscapulary region with small black shaft-stripes.

Hind neck indistinctly ashy grey.	*Hind neck* decidedly ashy grey, contrasting with head.
Lower back and rump same as rest of upper surface, and streaked in the same manner.	*Lower back and rump* entirely uniform isabelline, with no shaft-streaks.
Upper tail-coverts dark brown, with rufescent margins.	*Upper tail-coverts* light ash-colour, paler than the tail, and margined with whitish.
Upper wing-coverts and quills dark brown, with broad rufous margins.	*Upper wing-coverts and quills* brown, broadly margined with pale sandy, shading off into white on the margins.
Ear-coverts deep rufous, with slight fulvous shaft-streaks.	*Ear-coverts* very pale sandy.
Cheeks and throat white, with a few black spots.	*Cheeks and throat* pure white, unspotted.
Under surface of body isabelline, with vinous tinge on flanks; breast broadly streaked with black.	*Under surface of body* white, with a few triangular spots of dusky black on the breast.
Under wing-coverts deep isabelline vinous.	*Under wing-coverts* very pale isabelline sand-colour.

Male. Differs from the female in having a very much larger bill, and in being generally larger than his mate. This fact I can establish satisfactorily by five carefully sexed specimens shot by Mr. T. C. Atmore and the late Mr. Andersson. These are marked all males by their collectors, and measure as follows:—

	Total length. in.	culm. in.	wing. in.	tail. in.	tarsus. in.
1. ♂, Colesberg (*T. C. Atmore*)..	7·6	0·95	4·15	3·4	1·05
2. ♂, Eland's Post (*T. C. Atmore*)	7·2	0·9	4·1	3·25	1·1
3. ♂, Nonnberg (*T. C. Atmore*)..	8·0	0·95	4·25	3·6	1·15
4. ♂, Great Namaqua Land (*C. J. Andersson*)	7·8	0·95	4·4	3·5	1·1
5. ♂, Tjobis, Damara Land (*C. J.. Andersson*)	7·9	..	4·35	3·45	1·15

A specimen (not sexed) collected in Benguela by Mr. Monteiro is also in the Museum. It differs from any of the others before me in not having the vinous or isabelline tint clearly developed, the upper surface being ashy brown, with distinct shaft-lines. The under surface is entirely white, with a few small triangular streaks of blackish on the chest. It measures as follows:—Total length 7·2 inches, culmen 0·9, wing 3·95, tail 3·15, tarsus 1·05; and I think it is very probably a young bird.

It appears therefore from the foregoing measurements that the female averages from 3·65–3·75 inches in length of wing, and

0·75–0·8 in length of bill; while in the male the wing is 3·95–4·4 and the bill 0·9–0·95. It will be noticed that the three males last measured in the Table are very much bigger than the first two; but even these do not agree together in size of bill. The males numbered 1 and 2 agree with Mr. Monteiro's bird in having the bill much thinner than any of the others; but such a gradual gradation exists in the series that I do not see the necessity of creating another species, since the more I study Larks the more I find that size of bill goes for very little.

Hab. The northern parts of the Cape Colony, ranging over the whole of South Africa to Damara Land and Benguela.

Specimens examined.

E mus. Brit.:—*a.* South Africa (*Sir A. Smith**). *b*, ♂. Great Namaqua Land (*C. J. Andersson*). *c.* Benguela (*Monteiro*).

E mus. R. B. S.:—*a, b.* South Africa (*E. L. Layard*). *c, d*, ♀. Hope Town (*T. C. Atmore*). *e*, ♂. Colesberg (*T. C. Atmore*). *f*, ♂. Eland's Post (*T. C. Atmore*). *g*, ♂. Nonnberg (*T. C. Atmore*). *h*, ♀. Griqualand (*T. C. Atmore*). *i*, ♂. Tjobis, Damara Land, May 30, 1866 (*C. J. Andersson*). *k*, ♀. Objimbinque, May 30, 1866 (*C. J. Andersson*).

E mus. H. B. Tristram:—*a, b*, ♂. Damara Land (*Andersson*).

5. ALÆMON NIVOSA.

Certhilauda nivosa, Sw. B. W. Afr. i. p. 213 (1837); id. Classif. B. ii. p. 293 (1837).

Alauda albescens, Lafr. R. Z. 1839, p. 259; Giebel, Thes. Orn. p. 290 (1872).

Alauda guttata, Lafr. R. Z. 1839, p. 259.

Alauda codea, Smith, Ill. Zool. S. Afr. Aves, pl. 87. fig. 1 (1849, *ptil. hiem.*); Layard, B. S. Afr. p. 209 (1867); Sharpe, Cat. Afr. B. p. 72 (1871).

Alauda lagepa, Smith, Ill. Zool. S. Afr. Aves, pl. 87. fig. 2 (1849, *ptil. æstiv.*).

Megalophonus guttatus, Bp. Consp. i. p. 243 (1850); Layard, B. S. Afr. p. 215 (1867); Gray, Hand-l. B. ii. p. 123 (1870).

Megalophonus lagepa, Bp. Consp. i. p. 243 (1850); Layard, B. S. Afr. p. 214 (1867); Gray, Hand-l. B. ii. p. 122 (1870); Gurney, in Anderss. B. Dam. Ld. p. 200 (1872).

Galerita pyrrhonota, Bp. Consp. i. p. 245 (1850).

Calendulauda albescens, Blyth, J. A. S. B. xxiv. p. 258 (1855).

Megalophonus albescens, Gray, Hand-l. B. ii. p. 123 (1870).

Adult in summer plumage. Above brownish cinnamon, streaked with black down the shafts of the feathers, these shaft-streaks disappearing on the rump; hind neck with a scarcely perceptible shade of greyish, slightly distinguishable on the sides; wing-coverts and quills dark brown, margined with cinnamon-rufous, shading off into a fulvous edging on the extreme margin of the greater coverts and some of the secondaries, the innermost of which are more broadly edged; upper tail-coverts rufous, with distinct blackish shaft-streaks; tail dark brown, with pale edgings of fulvous brown, the two centre feathers broadly and the two outermost narrowly margined with cinnamon-rufous; lores and a distinct eyebrow creamy buff; feathers in front of the eye blackish; under the eye another line of creamy-buff feathers; ear-coverts cinnamon; cheeks and throat dull white, varied with a few blackish spots; rest of under surface buffy white, slightly rufescent on the sides of the body, the fore neck and breast thickly spotted with dark brown, the spots becoming narrower and more longitudinal on the sides of the breast and flanks; thighs rufous; under tail-coverts white, the shafts rufous, the longest plumes rufous, with black shafts and a whitish tip; under wing-coverts ashy brown, like the inner lining of the wing; "bill light reddish brown, the lower mandible pale buff orange towards the base; legs and toes intermediate between brownish and yellowish brown, and tinted with flesh-red; claws light reddish brown; iris bright brown; eyebrow rusty white" (*Sir A. Smith*). Total length 7 inches, culmen 0·7, wing 3·65, tail 3·8, tarsus 1·05.

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* Type of the species.

Winter plumage. Entirely different from the summer dress. Above ashy grey, with a slight sandy-coloured tinge, the black central stripes broad but obscure, rather plainer on the middle of the back and scapularies, which are rather broadly margined with creamy white; wing-coverts dark greyish brown, with ashy margins to least series, the greater and median series broadly edged with whitish; quills dark brown, margined with ashy, the secondaries broadly edged with whitish; rump and upper tail-coverts rather more distinctly washed with sandy colour than the back, the latter with dark brown shaft-stripes; tail-feathers dark brown, the centre feathers shaded with greyish and plainly margined with ashy white, the outermost feathers having also a slight edging of the same; eyebrow and streak below the eye white; feathers in front of the latter blackish; ear-coverts uniform ashy grey like the back, but without dark shaft-streaks; hinder part of cheeks washed with ashy grey; fore part of cheeks and throat white, with an indistinct moustachial line of blackish spots; sides of neck and under-surface of body white, with triangular blackish spots from the lower throat to the breast, changing into longitudinal streaks on the sides of the breast and flanks and under tail-coverts; sides of the body inclining to greyish, as also the thighs; under wing-coverts and wing-lining entirely ashy brown; "bill, legs, toes, and claws deep orange-coloured brown, shaded with brownish red, the lower mandible towards the base sienna-yellow" (*Sir A. Smith*).

Considerable confusion exists in the synonymy of this Lark, principally due to the late Sir A. Smith. It will be seen that I unite his two species, *A. lagepa* and *A. codea*, into one, as I believe that they are nothing but the summer and winter plumage of the same bird. However curious this may seem, I think that it is not to be refuted on an examination of the specimens which I have before me. The Museum never obtained the type of *A. lagepa* from Sir Andrew; but we have the type of his *A. codea*, without doubt the example described, but not the original of his figure, which, it will be seen, does not tally with the description at all. Luckily the very specimen figured is in the Museum, and I am enabled therefore to state that it is an example of *C. nivosa* of Swainson (*C. albescens*, Lafr.), which I consider to be nothing but the winter plumage of *A. lagepa*. Although not possessing the actual type of *A. lagepa*, we have specimens in the Museum which thoroughly agree with Smith's description and figure; and intermediate in plumage between true *A. lagepa* and *A. albescens* is the typical specimen of *A. codea*; while Mr. Layard's skins from the Berg River are also changing, in my opinion, from summer to winter. There is a gradual cinnamon tint pervading the whole grey upper plumage that leaves little doubt as to its changing ultimately into the full-plumaged *A. lagepa*. The ear-coverts are already light cinnamon.

The following are the measurements of the series examined:—

	Culm. in.	wing. in.	tail. in.	tarsus. in.
a, ad. hiem., S. Africa (*Smith*)	0·7	3·35	2·5	1·0
b, imm., S. Africa (*Smith*)	0·7	3·45	2·7	
c, ad hiem., Capetown (*Butler*)	0·65	3·25	2·6	0·95
d, ad. hiem, Berg River (*Layard*)	0·7	3·35	2·5	0·95
e, ad. hiem., Berg River (*Layard*)	0·75	3·6	2·75	1·0
f, ad. æstiv., S. Africa (*Layard*)......	0·7	3·65	2·8	1·05

This species does not seem to vary in size so much as some of the other South-African Larks. Specimens *e* and *f* have larger and appreciably thicker bills and are probably males, though Smith says that in the only male *A. codea* he obtained the bill was "considerably shorter than in adult females, more conical, and the culmen towards the point less curved."

Hab. Western parts of the Cape colony, ranging from Capetown to Little Namaqua Land.

Specimens examined.

E mus. Brit.:—*a*, ad. vix æstiv. South Africa (*Sir A. Smith*, type of *A. codea*). *b*, *c*, ♂ ♀ æstiv. Grootberg, Little Namaqua Land (*C. J. Andersson*). *d*, ad. hiem. Cape of Good Hope (*J. Gould*). *e*, ad. hiem. S. Africa (*Sir A. Smith*, specimen figured by him *l. c.*).

E mus. R. B. S.:—*a*, ad. æstiv. S. Africa (*E. L. Layard*). *b*, *c*, ♀ hiem. Berg River (*E. L. Layard*). *d*, ad. hiem. Capetown (*W. Butler*).

E mus. H. B. Tristram:—*a*. South Africa (*Layard*).

3. HETEROCORYS, gen. n.

The type of this genus is a rare bird, the *A. breviunguis* of Sundevall, which has the appearance of an *Alæmon*, and a similar nostril, this character separating it from *Ammomanes*, which it resembles in its long tarsus and in the proportions of its bill.

6. HETEROCORYS BREVIUNGUIS. (Plate LXXVI. fig. 1.)

Alauda breviunguis, Sund. Œfv. K. Vet. Akad. Förh. Stockh. 1850, p. 99; Giebel, Th. Orn. p. 292 (1872).

Certhilauda breviunguis, Bp. Consp. i. p. 246 (1850); Gray, Handl. B. ii. p. 121 (1870).

Megalophonus pyrrhonothus, Gray in Mus. Brit. et Hand-l. B. ii. p. 123 (1870).

Adult male (one of the typical specimens). Above rufous fawn-colour, the margins of the dorsal plumes paler and more fulvescent, with broad centres of blackish brown; the head slightly crested and coloured like the back, the hind neck more greyish and somewhat separating the head from the back by an indistinct collar; wing-coverts coloured like the back, dark brown, with broad fulvescent margins, causing a somewhat mealy appearance; quills brown, margined with fulvous fawn-colour, very broad on the secondaries, and paler on the outer edges; lower back, rump and upper tail-coverts bright rufous fawn-colour with narrow blackish shaft-lines, broader on the last named; tail-feathers brown, bordered with fulvous, a little broader on the outermost feather and more rufous on the centre ones, which are shaded with ashy; lores and a distinct eyebrow fulvous white, tinged with fawn; ear-coverts rufous fawn, inclining to dark brown on their upper margin; cheeks fulvous white, with a few spots of dark brown; under surface of body isabelline buff, the throat unspotted; the flanks and chest washed with fawn-colour, the latter marked with a good many triangular spots of dark brown; under wing-coverts light fawn-colour, the outermost spotted with brown, the greater series ashy brown, like the inner lining of the wing, which is almost entirely of the latter colour, with a tinge of isabelline on the inner web; bill horn-brown, inclining to yellowish horn-colour at base. Total length 6·8 inches, culmen 0·8, wing 4·0, tail 3·1, tarsus 1·1.

Hab. Caffraria to the Transvaal.

Specimens examined.

E mus. Brit.:—*a*, *b*. South Africa (*Sir A. Smith*).

E mus. R. B. S.:—*a*, ♂. Transvaal, April 16th, 1844 (*Wahlberg*).

4. AMMOMANES. Type.

Ammomanes, Cab. Mus. Hein. i. p. 125 (1850) .... *A. pallida*.

The characters given in the synopsis define the relations of this genus, in which a system of uniform dorsal coloration appears to be a point of no small generic significance.

Key to the species.

a. Larger; ear-coverts fawn-colour or rufous; tail without white tips to the inner webs.
  a'. Inner lining of wing lead-coloured, with no perceptible lighter shade on inner web of primaries .... 7. *ferruginea*.
  b'. Inner lining of wing pale ashy, with the inner webs of the primaries inclining to isabelline .... 8. *erythrochlamys*.
b. Smaller; ear-coverts whitish or slightly washed with isabelline; tail tipped with white spots on inner webs of the feathers .... 9. *grayi*.

7. AMMOMANES FERRUGINEA.

Alauda ferruginea, Lafr. R. Z, 1839, p. 258; Smith, Ill. Zool. S. Afr. Aves, pl. 29 (1847); Layard, B. S. Afr. p. 208 (1867).

Megalophonus ferrugineus, Bp. Consp. i. p. 244 (1850); Gray, Hand-l. B. ii. p. 122 (1870).

Adult (type of species). Above uniformly deep vinous cinnamon, the head coloured like the back and showing no pronounced grey shade on the hind neck; least wing-coverts uniform with the back, inasmuch as the brown bases to the feathers are concealed; median and greater coverts dark brown, margined with cinnamon shading off into yellowish buff on the extreme edge of the feathers; quills light brown, with ashy fulvous edges, the secondaries more broadly margined, with cinnamon shading into whitish on extreme edges, especially the innermost, where the cinnamon colour occupies the greater part of the feather, leaving the centre of it only longitudinally brown; rump vinous cinnamon, the upper tail-coverts rather inclining to brownish cinnamon, resembling the centre tail-feathers, which are longitudinally brownish down the centre, and by no means so bright cinnamon as the back; rest of the tail-feathers very dark brown, narrowly edged with cinnamon buff, a little more broadly on the penultimate feather, and very distinctly on the outermost, where the rufescent margin occupies more than half of the outer web; lores and feathers under the eye dull white, as well as an ill-defined eyebrow; ear-coverts uniformly cinnamon; cheeks, throat, and sides of neck whitish, the former slightly spotted with blackish forming an indistinct moustache; rest of under surface creamy white, shading into ashy-rufous on the flanks and thighs, the sides of the upper breast rufous; lower throat and breast very distinctly marked with blackish spots, those on the former triangular, gradually becoming more longitudinal on the breast, and disappearing on the sides of the body, many of the longitudinal streaks washed with rufous; under wing-coverts and inner lining of wing almost uniformly ashy or leaden brown, the innermost secondaries washed with rufous on inner web; some of the under wing-coverts with indistinct whitish edgings; under tail-coverts creamy-white washed with cinnamon towards the tips of the middle ones; "bill dark yellowish brown, passing towards the base of the lower mandible into dusky yellow; feet and claws light yellowish brown; eyes dark brown" (*Sir A. Smith*). Total length 7·5 inches, culmen 0·7, wing 4·1, tail 3·2, tarsus 1·2.

Hab. "The extensive arid plains to the southward of the Orange River" (*Smith*). Of this species I have only seen a single specimen, the type, now preserved in the Museum. Sir Andrew Smith seems to have procured more, as he writes of the female that she has the ground-colour "not quite so bright as in the male; and the brown streaks on the breast are less distinct;" nor does he appear to have looked upon it as a scarce bird.

Specimens examined.

E mus. Brit.:—*a*, ♂ ad. South Africa (*Sir A. Smith*, type of species).

8. AMMOMANES ERYTHROCHLAMYS.

Alauda erythrochlamys, Strickl. Contr. Orn. 1852, p. 151; Gray, Hand-l. B. ii. p. 118 (1870); Sharpe, Cat. Afr. B. p. 72 (1871); Gurney in Anderss. B. Dam. Ld. p. 194 (1872).

Megalophonus erythrochlamys, Ayres, Ibis, 1874, p. 103, pl. iii. fig. 2.

Adult male in winter plumage. Above uniform pale fawn-colour, with indistinct shaft-stripes of dull rufous on some of the feathers of the head and back; wing-coverts pale fawn, like the back, but with pale yellowish buff margins to the feathers; quills pale brown, broadly margined with fawn-colour, the secondaries more broadly, the innermost being coloured like the wing-coverts and margined in the same manner with yellowish buff; tail dark brown, narrowly margined with fulvous fawn-colour, occupying the entire outer web of the last tail-feathers, and running round the tip and up the margin of the inner web of this and the penultimate feather; the two centre feathers bleached fawn-colour, paler than the back; lores, feathers below and above the eye, forming an eyebrow, and cheeks white, the ear-coverts pale fawn-colour like the back; under surface of body creamy white, washed with fawn-colour on the sides of the body, the chest spotted with triangular markings of pale brown; thighs pale fawn; under tail-coverts creamy white; under wing-coverts buffy whitish, the greater series pale ashy brown, the outer plumes fawn-coloured; inner lining of wing also pale ashy brown, inclining to pale fawn-colour at base of inner web. Total length 6·5 inches, culmen 0·75, wing 3·6, tail 2·8, tarsus 1·05.

Summer plumage. The summer dress is different from the winter, and is of much rarer occurrence in collections; indeed I have only seen one example, the one figured by Mr. Ayres (*l. c.*), which differs in the following particulars:—

a. In being deeper cinnamon above, the quills and coverts all being edged with the same dark colour.

b. In having the tail broadly edged and tipped with cinnamon rufous, the outermost feathers not paler-margined, the two centre ones being almost entirely cinnamon, with a broad streak of greyish black down the middle.

c. In having a greyish shade on the hind neck, which is not seen in the winter dress.

d. In having the lores, eyebrow, sides of face and underparts generally washed with yellowish; and

e. In having more numerous and more distinct brown spots on the chest.

Young. Appears to differ from the adult only in having a few whitish tips to the feathers of the head and scapulars, the wing-coverts and quills being also much paler-edged.

Hab. From the Transvaal (summer) to Damara Land (winter).

This species is very closely allied to *A. ferruginea*, from which it differs in its smaller size and slightly more vinous cinnamon-colour. The female differs from the male in having a thinner and more slender bill; but the males do not seem to approach *A. ferruginea*; nor does the wing quite agree, as will be seen by comparing the wing of *A. erythrochlamys* with that of that species.

The first primary in *A. ferruginea* is much bigger, and the distance between its tips and the tip of the second primary is 1·5 inch, whereas in *A. erythrochlamys* it measures 1·35—4 inches; but even this varies a good deal, and the best difference between the two species lies in the larger size and greyish flanks of *A. ferruginea.*

The series now before me measure as follows:—

	Total length. in.	culm. in.	wing. in.	tail. in.	tarsus. in.
a, ♀ ad., Transvaal (*Ayres*) ..	6·8	0·7	3·5	2·8	1·05
b, ♀ ad., Damara (*Wahlberg*)	6·5	0·65	3·4	2·8	1·05
c, ♂ juv. „ (*Andersson*)	6·5	0·7	3·3	2·7	1·05
d, ♂ ad. „ „	6·8	0·75	3·55	2·9	1·15
e, ♂ ad. „ „	6·5	0·75	3·6	2·8	1·05

Compare with the above the dimensions of *A. ferruginea.*

	Total length. in.	culm. in.	wing. in.	tail. in.	tarsus. in.
a, ad. South Africa (*Sir A. Smith*)	7·5	0·7	4·1	3·3	1·25

Specimens examined.

E mus. Brit.:—*a*, *b*, ad. Walvisch Bay, Damara Land (*C. J. Andersson*).

E mus. R.B.S.:—*a*, ♂ juv. Walvisch Bay, Damara Land, May 26th, 1864 (*C. J. Andersson*). *b*, ad. Damara Land (*C. J. A.*). *c*, ♀ ad. Damara Land, Nov. 20th, 1854 (*Wahlberg*).

E mus. J. H. Gurney:—*a*, ♀ ad. Potchefstroom, Transvaal, June 20th, 1872 (*T. Ayres*).

E mus. H. B. Tristram:—*a*, ♀. Walvisch Bay, Jan. 27th, 1864 (*C. J. Andersson*).

9. AMMOMANES GRAYI. (Plate LXXVI. fig. 2.)

Alauda Grayi, Wahlb. Œfv. K. Vet. Akad. Förh. Stockh. 1855, p. 213; id. J. f. O. 1857, p. 2; Gray, Hand-l. B. ii. p. 118 (1870); Sharpe, Cat. Afr. B. p. 71 (1871); Gurney in Andersson, B. B. Dam. Ld. p. 193 (1872).

Alauda nævia, Chapm. Trav. S. Afr. App. p. 400 (1868).

Adult male. Above light sandy isabelline, not paler on the head, but slightly fulvescent on the hind neck; forehead, lores, and a tolerably defined eyebrow whitish; feathers in front of the eye dusky blackish; sides of face whitish, the hinder ear-coverts washed with isabelline; entire under surface of body whitish, slightly washed with isabelline on the breast, on each side of which is an indistinct blackish patch; under wing-coverts white, with a very faint isabelline tinge; upper wing-coverts sandy isabelline like the back, with light whitish margins, mottled also by means of the grey bases to the feathers showing; quills greyish, slightly tipped with white and margined with sandy colour on the outer web, the primaries very narrowly bordered, but the secondaries very broadly, the innermost being entirely rufous sand-colour, with broad longitudinal greyish centres, the inner lining of the wing greyish, inclining to white near the base of the inner web; tail dark brown tipped with white on the inner web, the centre feathers grey, with sandy-coloured margins and tips, the basal third of the tail-feathers isabelline inclining to whitish, and extending further up the outer web of the external feathers. Total length 4·8 inches, culmen 0·65, wing 3·25, tail 1·8, tarsus 0·85.

Adult female. Similar to the male, but rather smaller in the wing. Total length 4·8 inches, culmen 0·6, wing 3·05, tail 1·8, tarsus 0·85

Hab. Damara Land.

Specimens examined.

E mus. Brit.:—*a.* Damara Land (*C. J. Andersson*).

E mus. R. B. S.:—*a, b,* ♂ ♀. Oosop, Damara Land, Nov. 30 and Dec. 2, 1866 (*C. J. Andersson*). *c.* Sand Fountain, Walrisch Bay, April 19, 1865 (*C. J. A.*).

E mus. H. B. Tristram:—*a,* ♂. Oosop, Damara Land, Nov. 30, 1866 (*C. J. A.*).

Genus 5. ALAUDULA.

	Type.
Alaudula, Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 471 (1856, *ex Blyth MS.*)	*A. raytal.*

Confined to the Indian peninsula, and not represented in Africa.

Genus 6. RHAMPHOCORYS.

	Type.
Rhamphocorys, Bp. C. R. xxxi. p. 423 (1850)	*R. clot-bey.*
Ierapterhina, Desmurs et Lucas, Rev. et Mag. de Zool. 1851, p. 24	*R. clot-bey.*

Appears to be rather an exaggerated *Ammomanes*, and not to have any great affinity with *Melanocorypha.*

Genus 7. ALAUDA.

	Type.
Alauda, Linn. S. N. i. p. 287 (1766)	*A. arvensis.*

Genus 8. CALANDRELLA.

	Type.
Calandrella, Kaup, Natürl. Syst. p. 39 (1829)	*C. brachydactyla.*
Coryphidea, Blyth, J. A. S. B. xiii. p. 960 (1844)	*C. brachydactyla.*
Calandritis, Cab. Mus. Hein. Th. i. p. 122 (1850)	*C. brachydactyla**.

Differs from *Alauda* chiefly in its thicker bill, otherwise very closely allied. Distinguished by larger and more sharply pointed wings.

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* I presume, from the general references of ornithologists, that the type of *Calandritis* is the Short-toed Lark, as Cabanis proposed to supersede with this term the unclassical titles of Kaup and Blyth; but were the first species mentioned of each genus to be regarded as the type, then *A. cinerea* would be the type of *Calandritis*, which would thus supersede my genus *Tephrocorys* (*vide infrà*, p. 633).

Genus 9. SPIZOCORYS.

Type.

Spizocorys, Sundev. Av. Tent. p. 55 (1873) .... *S. conirostris.*

Remarkable for its minute first primary, which escaped the observation of Professor Sundevall. Wings very much rounded, the primaries and secondaries nearly equal.

10. SPIZOCORYS CONIROSTRIS.

Alauda conirostris, Sundev. Œfv. K. Vet. Akad. Förh. Stockh. 1850, p. 99; Bp. Consp. i. p. 244 (1850); Gray, Handl. B. ii. p. 118 (1870); Sharpe, Cat. Afr. B. p. 72 (1871); Gurney, in Anderss. B. Dam. Ld. p. 192 (1872); Ayres, Ibis, 1874, p. 103, pl. iii. fig. 1.

Coraphites conirostris, Licht. Nomencl. Av. p. 39 (1854).

Calandrelia, sp., Bocage, Jorn. Lisb. i. p. 152 (1867).

Calandritis minor, Bocage, *op. cit.* ii. p. 351 (1869).

Spizocorys conirostris, Sundev. Av. Tent. p. 55 (1873).

Adult female (one of the typical specimens). Above fulvous brown, the feathers of the head and back blackish down their centres, which are very broad, the margins being sandy, more or less inclining to deeper rufous; all the plumes of the hind neck, rump, and upper tail-coverts, as well as a few of the dorsal feathers, broadly margined with greyish, producing a distinct ashy appearance; wing-coverts brown, broadly margined with sandy buff, the lesser and median series so broadly as nearly to obscure the dark brown centres to the feathers, the greater coverts with a slight greyish shade on their outer margins; quills lighter brown, with a slight ashy shade, the feathers margined with sandy buff, paling on the extreme edge of the feather, the outer edge of the first primary sandy white for nearly the entire length of the quill; tail blackish, tipped with dull white, with ashy fulvous margins, broader on the centre feathers, which are paler and nearly uniform brown, the two outer feathers margined with sandy buff, occupying part of the inner web and the tip of the outermost; a distinct line of white over and under the eye, with a small patch of blackish feathers in front of the latter; ear-coverts brown, blackish on upper margin; cheeks white, washed with pale brown on hinder margin, and spotted with black, a narrow line of which runs from the gape to the ear-coverts; throat pure white, with a few black spots on lower portion; rest of under surface of body sandy rufous, paler and more fulvous on the lower abdomen, the fore neck and chest rather largely spotted with triangular spots of blackish brown; under wing-coverts sandy bnff, the lower series inclining to ashy, and resembling the inner lining of the wing. Total length 4·7 inches, culmen 0·5, wing 3·0, tail 1·75, tarsus 0·75.

Eight specimens of this pretty little Lark are before me, as enumerated below; and I appear to have the extremes of summer and winter plumage, with intermediate grades. For the determination of the species I describe one of the typical specimens in my own collection, received in exchange from the Stockholm Museum; but Mr. Gurney owns an example in still fuller plumage, the specimen figured (badly) in 'The Ibis' for 1874 (p. 103). The general colour of this bird above is reddish sand-colour, varied with black centres to the feathers; and the under surface is likewise deep sandy rufous with white throat and triangular chest-spots (wing 3·0). This specimen was shot at Potchefstroom by Mr. Ayres, on the 16th of June, 1872, and is a female. Another female, killed by Mr. Andersson at Ondonga on the 1st of November, 1867, is in what I take to be the winter dress of the bird. The general colour is a sandy buff, with no rufous tinge to speak of, but with narrow blackish centres to the feathers; and the under surface is buffy white tinged with sandy rufous on the chest, which is streaked with narrow little spots of blackish brown: the throat and sides of the face are white, with a blackish malar stripe forming an indistinct moustache. I think there can be no doubt of this being the winter plumage of *A. conirostris*. The difference of being more mealy is usual in the winter dress of Larks; and the proportions fairly agree (wing 2·85, tarsus 0·75). Two male specimens are in my own collection from the Hountop River, Great Namaqua Land, shot by Mr. Andersson on the 3rd of June, 1862. These birds are intermediate between the winter and summer specimens described. They are rather mealy in appearance; but the dark centres to the feathers of the upper surface are becoming somewhat pronounced, and several of the dark chest-spots are developing, appearing as if the summer plumage were gained by the wearing-off of the sandy margins. These birds have the wing 2·9–3·0 inches, and the tarsus 0·75.

The white on the outer tail-feathers varies very much in extent. In this young specimen it occupies the outer web and half of the inner one, as it does also in Wahlberg's Transvaal skin and the Ondonga female; but in the full-plumaged bird in Mr. Gurney's collection, and in both the Namaqua examples the sandy white is confined to the outer web and forms a narrow margin to the tail.

Young. Above dark brown, the feathers washed with sandy colour and tipped with white; the hind neck inclining to ashy grey, the white tips almost imperceptible; wing-coverts dull brown margined with sand-colour and ending in a white tip; quills and tail much as in adult, but inclining to whitish at the tips of the feathers; lores dusky blackish; sides of face nearly uniform brown, with a blackish streak running along the upper margin of the ear-coverts and down the cheeks; under surface pale isabelline, the throat spotted with dusky, and having on each side a moustachial streak of the same, the breast inclining to sandy brown on the sides and obscurely spotted with dusky.

Hab. Caffraria, and the Transvaal (summer) to Damara Land (winter).

Specimens examined.

E mus. Brit.:—*a*, ad. Near Wilson's Fountain, Damara Land (*C. J. Andersson*). *b, c,* ♂. Hountop River, Great Namaqua Land, May 27, 1862 (*C. J. A.*).

E mus. R. B. S.:—*a*, ♀ ad. Transvaal (*Wahlberg*). *b*, ♂ ad.

Objimbinque, Damara Land, June 20, 1866 (*C. J. A.*). *c*, ♀. Ondonga, Ovampo Land, November 1, 1867 (*C. J. A.*).

E mus. J. H. Gurney:—*a*, ♀. Potchefstroom, Transvaal, June 16, 1872 (*T. Ayres*).

E mus. H. B. Tristram:—*a*, ♀. Transvaal, May, 1870 (*T. Ayres*).

10. TEPHROCORYS, gen. n.

11. TEPHROCORYS CINEREA.

La Cendrille, Buff. H. N. Ois. v. p. 64.

Cinereous Lark, Lath. Gen. Syn. ii. pt. 2, p. 388 (1783).

Alauda cinerea, Gm. S. N. i. p. 798 (1788, ex Lath.); Scl. P. Z. S. 1866, p. 23; Sharpe, Cat. Afr. B. p. 71 (1871); Giebel, Thes. Orn. p. 293 (1872); Buckley, Ibis, 1874, p. 383.

La petite Alouette à tête rousse, Levaill. Ois. d'Afr. iv. p. 199 (1800); Sundev. Crit. om Levaill. p. 46 (1857).

Megalophonus cinereus, Gray, Gen. B. ii. p. 382 (1844); Bp. Consp. i. p. 244 (1850); Layard, B. S. Afr. p. 212 (1867); Ayres, Ibis, 1869, p. 295; Gray, Hand-l. ii. p. 122 (1870); Gurney in Anderss. B. Dam. Ld. p. 197 (1872).

Calandritis cinerea, Cab. Mus. Hein. i. p. 123 (1850).

Alauda spleniata, Strickl. Orn. Syn. 1852, p. 152.

Calandrella cinerea, Licht. Nomencl. Av. p. 39 (1854); Gurney, Ibis, 1864, p. 353.

Megalophonus anderssoni, Tristr. Ibis, 1869, p. 434, et 1870, p. 444; Gurney, in Anderss. B. Dam. Ld. p. 198.

Adult male. Above ashy, mottled with dark brown centres to the feathers, some of the dorsal plumes washed with sandy colour; crown of head bright chestnut, forming a cap, some of the feathers slightly margined with fulvous; hind neck decidedly ashy, paler than the back and forming a kind of collar; wing-coverts ashy brown, with broad fawn-coloured margins, forming a conspicuous shoulder-patch; the greater and primary coverts ashy brown, with ashy-fulvous edgings; quills dark brown, margined with ashy fulvous, inclining to rufous near the base of the feathers; the outer primary with a broad external margin of creamy white; upper tail-coverts rufous fawn-colour, the longest shaded with brown down the middle; tail-feathers dark brown, the penultimate and outer feather edged with white occupying the whole external web of the latter; the two centre tail-feathers margined with ashy brown; small frontal plumes whitish; lores and a distinct eyebrow white, as also the feathers under the eye and the cheeks white, the latter slightly spotted with brown; ear-coverts pale rufous; sides of neck clear ashy grey; throat white; rest of under surface also white; the middle of the breast ashy fulvous; the sides of the upper breast bright chestnut, forming a patch on both sides; sides of body inclining to ashy fulvous, washed with fawn-colour on the lower flanks; thighs ashy fulvous; under wing-coverts pale ashy grey; the edge of the wing fulvous white; inner lining of wing ashy brown, the inner webs of the quills slightly rufescent towards the base; "bill yellowish brown;

legs and toes brownish or reddish brown; iris dark brown" (*C. J. Andersson*).

Total length 6·2 inches, culmen 0·55, wing 3·9, tail 2·7, tarsus 0·85.

Adult female. Coloured like the male. Total length 6·2 inches, culmen 0·5, wing 3·65, tail 2·6, tarsus 0·85.

The description is taken from a pair of birds collected and sexed by my friend Mr. Ayres. They are both, I take it, in full winter plumage; and I regret that I have the dates of scarcely any of my specimens, which makes it difficult to determine the seasonal changes of the species. Two examples, however, now before me differ sufficiently in their coloration to make me believe that they are in their breeding-dress; and I therefore give the following short notes on this plumage:—General colour more rufous than in winter, especially on the upper tail-coverts and crown, the latter being deep chestnut, and the patches on the sides of the breast much larger and extending further down the sides of the body, the centre of the chest being also washed with rufous.

Young. Above blackish, some of the feathers washed with sandy colour, but all of them terminally spotted or edged with creamy white, producing a pretty and variegated appearance; hind neck greyish mottled with dark brown and spotted with creamy white; head blackish varied with sandy rufous bases to the feathers and spotted with creamy white; lores and a broad eyebrow whitish, as also the sides of the face, which have, however, a mark of brown on the cheeks under the eye, while the ear-coverts are dark brown washed with rufous and spotted minutely with creamy white; under surface whitish, the breast and sides of body mottled, with dark brown bases to the feathers, inclining to rufous on the sides of the breast; under wing-coverts whitish ashy; quills brown broadly margined with rufous, the outer web of external primary fulvous white, the inner secondaries broadly edged with whitish; rump and upper tail-coverts bright fawn-colour spotted with white, before which is a subterminal spot of dark brown; tail blackish brown, the outermost feather white on the outer web, crossing the inner one obliquely near the tip, the two centre feathers rufous near the base and margined with whitish towards the tip.

Hab. Cape colony to the Transvaal and thence to Damara Land, where, however, the size is rather smaller (*vide infrà*).

Canon Tristram has very kindly sent me the whole of his collection of Larks for examination; and among them I find the type of his *Megalophonus anderssoni*. I am sorry I cannot indorse this bird as a good species; for it is assuredly the *Alauda spleniata* of Strickland, and I cannot see in it any more than a small subtropical form of *Tephrocorys cinerea*; and as such it would bear the title of *Tephrocorys spleniata*. The specimen identified as *C. anderssoni* by Mr. Blanford, which bears the handwriting of Canon Tristram, seems to me to be merely *C. ruficeps* in winter plumage (*cf.* Blanf. Geol. & Zool. Abyss. p. 389).

The specimen in Canon Tristram's collection measures as follows—

total length 5 inches, culmen 0·45, wing 3·15, tail 2·15, tarsus 0·8. I do not, however, believe that it has got its perfect plumage, the tail being still in full moult.

Specimens examined.

E mus. Brit.:—*a*, ad. South Africa (*Sir A. Smith*). *b*, *c*. Cape of Good Hope. *d*, ♂ ad. Cape Town, Sept. 24, 1866 (*C. J. Andersson*).

E mus. R. B. S.:—*b*, ad. South Africa (*Layard*). *c*, ad. Colesberg (*D. Arnot*). *d*, juv. Graham's Town (*E. L. Layard*). *e*, *f*, ♂ ♀ ad. Transvaal (*T. Ayres*).

E mus. H. B. Tristram:—*a*. South Africa (*Layard*). *b*. Cape colony (*Andersson*). *c*. Natal (*Ayres*). *d*, ♀? Objimbinque, Damara Land, March 13th, 1865 (*C. J. Andersson*).

11. MELANOCORYPHA.

	Type.
Melanocorypha, Boie, Isis, 1828, p. 322	*M. calandra.*
Calandra, Less. Compl. Buff. ii. p. 120 (1837) ..	*M. calandra.*
Londra, Sykes, P. Z. S. 1838, p. 114	*M. calandra.*
Corydon, Gloger, Handb. Naturg. p. 264 (1842, *nec* Less. 1828)	*M. calandra.*
Calandrina, Blyth, J. A. S. B. xxiv. p. 265 (1855)	*M. torquata.*

The thickset conical bill is one of the chief characters of the genus. Wings moderately pointed.

12. PALLASIA.

	Type.
Pallasia, E. von Homeyer, J. f. O. 1873, p. 190..	*P. mongolica.*

Remarkable for its short secondaries, which must make it conspicuously different in flight from other Larks.

13. LULLULA.

	Type.
Lullula, Kaup, Natürl. Syst. p. 92 (1829)	*L. arborea.*
Corys, Reich................................	*L. arborea.*

Not far removed from *Alauda*, but differing in the curved hind claw, and long first primary.

14. GALERITA.

	Type.
Galerida, Boie, Isis, 1828, p. 321..............	*G. cristata.*
Heterops, Hodgs. in Gray's Zool. Misc. p. 84 (1844)	*G. cristata.*

Often united by naturalists to *Lullula* and *vice versâ*. The two genera, however, appear to me well characterized, the wing-formula and shape of crest being quite different.

15. PYRRHULAUDA.

	Type.
Pyrrhulauda, Gray, Gen. B. ii. p. 381 (1844)* ..	*P. australis.*
Megalotis, Sw. Zool. Journ. iii. p. 347 (1827) (*nec* Ill.)	*P. leucotis.*
Coraphites, Cab. Arch. f. Naturg. xiii. p. 328 (1847)	*P. australis.*

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* Said by Gray to have been established by Sir A. Smith in 1829. Smith also states the same; but I cannot find where he proposed the genus.

16. CALENDULA.

	Type.
Calendula, Sw. Classif. B. ii. p. 292 (1837) ..	*C. crassirostris.*
Erana, Gray, List Gen. B. p. 48 (1840)	*C. crassirostris.*

Distinguished by its stout and *Calandra*-like bill, but otherwise much resembling *Alauda* in appearance, though of course the development of the first primary separates them at once.

12. CALENDULA CRASSIROSTRIS.

Alouette à gros bec, Levaill. Ois. d'Afr. iv. pl. 193 (1805); Sundev. Crit. om Lev. p. 46 (1857).

Alauda crassirostris, Vieill. N. Dict. d'Hist. Nat. i. p. 373 (1816); id. and Bonn. Enc. Méth. i. p. 323 (1823); Gray, Gen. B. ii. p. 380 (1844); Layard, B. S. Afr. p. 208 (1867); Gray, Hand-l. ii. p. 119 (1870); Sharpe, Cat. Afr. B. p. 71 (1871).

Alauda magnirostris, Steph. Gen. Zool. xiv. p. 27 (1826).

Melanocorypha crassirostris, Boie, Isis, 1828, p. 322.

Calendula magnirostris, Sw. Classif. B. ii. p. 292 (1837).

Megalophonus crassirostris, Bp. Consp. i. p. 243 (1850).

Galerita crassirostris, Licht. Nomencl. p. 39 (1854).

Calendula crassirostris, Gurney in Anderss. B. Dam. Ld. p. 195 (1872).

Ammomanes crassirostris, Sundev. Av. Tent. p. 54 (1872).

Adult. Above dark brown, the feathers tolerably broadly margined with sandy fulvous, getting lighter on the extreme edge of the feather; the lower back and rump ashy brown, more uniform, or having only a few central streaks of dark brown on the lower back; head rather lighter brown than the rest of the upper surface, the dark brown central streaks rather narrower; hind neck inclining to ashy fulvous and minutely streaked with dark brown; wing-coverts dark brown, somewhat shaded with ashy and rather broadly margined with sandy fulvous on the median and lesser coverts, the greater series margined with ashy, but without such distinct edges of sandy buff as the other series; quills brown, narrowly tipped and margined on the outer web with sandy white, the secondaries distinctly shaded with grey; upper tail-coverts ashy brown shaded with sandy and streaked with dark brown down the centres of the longest feathers; tail-feathers dark brown margined with ashy grey, the penultimate feather narrowly, and the outermost a little more broadly margined and tipped with sandy white or fulvous; lores, feathers above and below the eye, as well as a streak running along the sides of the crown fulvous white, but not forming a distinct eyebrow; cheeks fulvous white, minutely spotted with blackish brown; ear-coverts dark brown streaked with sandy buff; under surface of body dull yellowish white, the throat very slightly spotted with blackish brown, of which colour there is a moustachial line on each side; the breast thickly and distinctly streaked with blackish brown, gradually narrowing on the lower breast and sides of abdomen to hair-like lines; belly, vent, and under tail-coverts unspotted; flanks ashy brown streaked with dark brown; under wing-coverts pale ashy brown narrowly margined with sandy white, the outer feathers near the bend of the wing sandy white spotted with brown, the centres of the feathers being of this colour; "upper mandible horn-colour, the lower one buff shading into dark horn-colour towards the tip; legs pale brown; iris brown" (*Shelley*). Total length 6·8 inches, culmen 0·75, wing 4·0, tail 2·75, tarsus 1·0.

Young. Duller and more uniform brown than the adult, with whitish edgings to the feathers of the crown, ear-coverts, and wing-coverts, the greater series of the latter with sandy rufous margins; quills brown, paler towards the tips, and margined with sandy rufous paling into whitish buff towards the tips of the secondaries; under surface of body white, the breast streaked with blackish brown, each feather narrowly margined with whitish.

Winter plumage. Duller and more ashy brown than in summer, all the feathers obscured with greyish margins; underneath more yellowish, the spots on the breast duller and paler brown, and not nearly so largely developed.

Hab. The Cape colony, ranging into the eastern districts, and northwards into Little Namaqua Land.

As in the other South-African Larks, great variation in size of bill exists in the present species; and the want of carefully sexed specimens prevents my accounting for these differences; but the males seem to be rather larger, to judge from the following measurements, the only ones in which I have any guide to the sexes.

	Total length.	wing.	tail.	tarsus.
a, ♀ ad. Stellendorf (*G. E. Shelley*).	7·0 *	3·8	2·75	1·0
b, ♂ ad. Little Namaqua Land (*Andersson*)	6·8	3·95	2·85	0·98

Captain Shelley recently collected two birds in the Cape colony, towards the end of January. They appear to be young birds, in their first winter plumage, from which they are just emerging by a moult; but on the head the feathers have sandy-coloured margins. The new feathers are much richer brown, almost black in the centre, with rufescent margins; but these gradually get bleached in time.

Specimens examined.

E mus. Brit.:—*a.* S. Africa. *b*, *c.* Cape. *d*, ♀ ad. S. Africa (*Sir A. Smith*). *e.* S. Africa (*Andersson*).

E mus. R. B. S.:—*a*, ad. South Africa (*Layard*). *b*, juv. S. Africa (*Layard*). *c*, ♂ ad. Little Namaqua Land, July 29th, 1862 (*Andersson*). *d*, *e*, ♂ ♀ ad. Hope Town (*T. C. Atmore*).

E mus. G. E. Shelley:—*a.* Ceres, Cape colony, Jan. 28, 1874 (*G. E. S.*). *b*, ♀ ad. Stellendorf, Cape colony, Jan. 23, 1864 (*G. E. S.*).

E mus. H. B. Tristram:—*a.* South Africa (*Layard*).

17. MIRAFRA.

Type.

Mirafra, Horsf. Tr. Linn. Soc. xiii. p. 159 (1820) *M. javanica.*

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* In the flesh; 6·5 in skin.

	Type.
Brachonyx, Sw. Zool. Journ. iii. p. 344 (1827, *nec* Schönh. 1826)	*M. apiata.*
Corypha, Gray, List Gen. B. 1840, p. 48	*M. apiata.*
Megalophonus, Gray, List Gen. B. 1841, p. 62	*M. apiata.*
Plocealauda, Hodgs. in Gray's Zool. Misc. p. 84 (1844)	*M. assamica.*
Geocoraphus, Cab. Arch. f. Nat. xiii. p. 328 (1847)	*M. javanica.*

Distinguished by its open nostrils, which are devoid of the usual bristles. Having never met with the type of the genus (*M. javanica*), I have only been able to compare the Flores species, *M. parva*, of Swinhoe. The African species have, as a rule, rather thinner bills and fuller crests; but at present I follow Prof. Sundevall in placing them in *Mirafra*.

Key to the Species.

a. Tail varied with zigzag spots and bars of black.
  a'. General colour grey; primaries brown, edged with rufous, which does not, however, pass across the base of *both* webs. *apiata.*
  b'. General colour rufous; quills broadly margined with rufous, which at the same time occupies the basal half of both webs .... *rufipilea.*
b. Tail uniform, with rufous edgings to the centre feathers.
  c'. Inner web of the quills rufous, as also the outer web of the primaries, making the entire base of the quills rufous, excepting the brown shaft.
    a''. Larger, with a conspicuous rufous nape-patch, contrasting with the rest of the upper surface, which is brown, with darker centres to the feathers .... *africana.*
    b''. Smaller; no nape-patch, the nape being the same as the head and back.
      a'''. General colour grey, with brown shaft-streaks; tail-feathers edged and tipped with white .... *damarensis.*
      b'''. General colour fawn, with brown shaft-stripes; tail-feathers margined with rufous .... *africanoides.*
  d'. Bases of the quills not entirely rufous, this colour confined to the outer web.
    c''. Inner lining of wing leaden grey, as also are the under wing-coverts, the inner webs of the primaries narrowly isabelline; outer tail-feathers black, narrowly margined with isabelline.
      α. Larger, with very stout bill .... *nævia.*
      β. Smaller, with slender bill .... *sabota.*
    d''. Inner lining of wing pale or deep rufous, as also the inner webs of the primaries; two outer tail-feathers almost entirely white.
      γ. Larger; two outer tail-feathers white on outer web...... *fringillaris.*
      δ. Smaller; three outer tail-feathers externally white ...... *cheniana.*

13. MIRAFRA APIATA.

L'Alouette bateleuse, Levaill. Ois. d'Afr. iv. pl. 194 (1805); Sund. Crit. om Levaill. p. 46 (1857).

Alauda apiata, Vieill. N. Dict. d'Hist. Nat. i. p. 342 (1816); id. and Bonn. Enc. Méth. i. p. 321 (1823); Grill, Zool. Anteckn. p. 40 (1858); Giebel, Thes. Orn. p. 291 (1872).

Alauda clamosa, Steph. Gen. Zool. xiv. p. 23 (1826).

Brachonyx apiata, Smith, Ill. Zool. S. Afr. pl. 110. fig. 1 (1849).

Megalophonus apiatus, Bp. Consp. i. p. 244 (1850); Layard, B. S. Afr. p. 215 (1867); Gray, Hand-l. B. ii. p. 122 (1870).

Adult. Above cindery grey, with concealed bars of cinnamon rufous and black on most of the dorsal feathers, as well as all the wing-coverts; head uniform with back, much crested, the feathers blackish in the centre of the plumes, which are also minutely spotted with rufous; hind neck cindery grey, separating the head from the back; quills dark brown, margined with rufous, the inner secondaries with grey like the back, the innermost washed with rufous and crossed with narrow transverse black lines; tail dark brown washed with cindery grey, and tipped with white, the outermost feather broadly edged with fulvous extending over a great portion of the inner web obliquely towards the tip, the centre feathers slightly washed with rufous and minutely barred with blackish in an irregular manner, besides a few spots of the latter here and there; loral feathers minutely tipped with white, and behind the eye a small streak of buffy white; ear-coverts light rufous, inclining to blackish on their hinder margin; rest of the sides of the face light fulvous thickly speckled with blackish; throat whitish, with a few scattered spots of blackish brown; rest of under surface ashy fulvous, the feathers being all broadly margined with this colour, and thus obscuring the pale fawn-colour of their bases, the breast thickly spotted with large triangular marks of dark brown, and on the flanks a few narrow lines of dark brown; the under tail-coverts minutely spotted with dark brown; under wing-coverts fawn-colour, except the outermost, which are washed with ashy brown, like the greater series and the entire inner lining of the wing. Total length 5 inches, culmen 0·55, wing 3·0, tail 2·2, tarsus 1·0.

Hab. Confined to the Cape colony.

The full-plumaged specimens before me of this Lark have not their dates of capture attached; but I believe that I have both winter and summer plumages represented, thus disposing of the idea that *M. apiata* can be the winter plumage of *M. rufipilea.* I therefore append short comparative characters of the two states, the specimen described being in what I consider full winter dress.

Summer plumage.	Winter plumage.
Upper surface dark brown, the rufous obscure and the grey shade strongly marked only on the lower back and secondaries.	*Upper surface* grey, the rufous colour in broad and half-concealed bands.
Head dark brown, with scarcely any grey shade or rufous markings.	*Head* entirely grey, mottled with blackish centres to the feathers, and slightly washed here and there with rufous.
Hind neck scarcely lighter than the head or back.	*Hind neck* very clear grey, paler than head or back.
Wing-coverts ending in a rufous tint, with no perceptible grey margin.	*Wing-coverts* with a broad whitish grey margin.

Inner secondaries with a narrow whitish shaft-line, from which radiate about six narrow whitish cross lines.

Tail nearly uniform brown, with an obsolete shade of greyish on centre feathers, the external feathers being light fawn-colour on outer web.

Eyebrow pale fawn.

Under surface of [illegible] bright fawn, the throat and chest spotted with black.

Inner secondaries dark brown, brown in the centre and at entire base of feather, with only a few imperfect indications of black near the tip.

Tail dark brown, tipped with white, the centre feathers clearly washed with grey as well as slightly tinged with rufous, and plainly marked with blackish indications and spots near the shafts.

Eyebrow ashy fulvous.

Under surface ashy fulvous, concealing fawn-coloured bases to the feathers, the chest-spots much obscured.

The measurements of Sir Andrew Smith's two specimens are as follows:—

	Total length.	culm.	wing.	tail.	tarsus.
	in.	in.	in.	in.	in.
a. S. Africa *Smith* ..	6·5	0·55	3·4	2·5	1·0
b. S. Africa *Smith* ..	6·5	0·6	3·25	2·4	0·95

The usual Alaudine variation in size is here apparent; but the absence of correct sexing to the specimens prevents me from drawing any deduction.

Captain Shelley shot a male at Stellendorf, in the Cape colony, which had the soft parts as follows:—"Iris hazel; legs white, with a faint flesh-coloured shade; bill dark horn-colour, with the basal two thirds of the lower mandible and the edges of the upper one towards the gape buff." It measured as follows—total length 6 inches, culmen 0·6, wing 3·15, tail 2·55, tarsus 1·05. This bird is in full moult, and seems to be a young individual gaining its first complete dress. On the upper surface it has several conspicuous white margins to the feathers and a great deal of rufous, reviving the idea that it might be *M. rufipilea*—a conclusion which the broad rufous margins to the quills seem to indorse; but I find that the rufous is confined to the outer margin of the primaries, whereas in *M. rufipilea*, of which I believe I have young and old, the rufous extends across both webs. The explanation will, I trust, be found in the fact that the young of *M. apiata* is much more rufous than the adult. In Captain Shelley's specimen the eyebrow is creamy white and very conspicuous, and the entire abdomen is also creamy white. Canon Tristram's collection likewise contains two examples, one marked *M. rufipilea* from Kuruman: the admixture of grey in the rufous and the unfailing character of the quills shows that it is *M. apiata*, notwithstanding the general rufous appearance. It is probable therefore that *M. apiata* resembles *M. rufipilea* in its young stage, though differing much in the adult.

Specimens examined.

E mus. Brit.:—*a, b*, ad. South Africa (*Sir A. Smith*). *c*. Capetown (*C. J. Andersson*).

E mus. G. E. Shelley:—*a*, ♂ imm. Stellendorf, Cape colony, January 22, 1874 (*G. E. S.*).

E mus. H. B. Tristram:—*a*. Cape of Good Hope. *b, c*. South Africa (*Layard*). *d*. Kuruman (*Layard*).

14. MIRAFRA RUFIPILEA.

L'Alouette à calotte rousse, Levaill. Ois. d'Afr. iv. pl. 198 (1805); Sundev. Crit. om Levaill. p. 46 (1857).

Alauda rufipilea, Vieill. N. Dict. d'Hist. Nat. i. p. 345 (1816); Sharpe, Cat. Afr. B. p. 72 (1871).

Megalophonus rufipileus, Gray, Gen. B. ii. p. 382 (1844); Bp. Consp. i. p. 243 (1850); Layard, B. S. Afr. p. 211 (1867); Gray, Hand-l. B. ii. p. 122 (1870); Ayres, Ibis, 1871, p. 268.

Brachonyx pyrrhonota, Smith, Ill. Zool. S. Afr. Aves, pl. cx. fig. 2 (1849, *nec Vieill.*).

Alauda fasciolata, Sundev. Œfv. K. Vet. Akad. Förh. Stockh. 1850, p. 99 (1850).

Megalophonus fasciolatus, Licht. Nomencl. p. 39 (1854); Gray, Hand-l. ii. p. 122 (1870).

Megalophonus apiatus, Ayres, Ibis, 1869, p. 295.

Adult male. Above entirely cinnamon rufous, the feathers of the crown faintly tipped with whitish, these being much broader and more distinct on the back, scapulars, and wing-coverts, these light tips relieved by a subterminal line of black, most of the feathers being blackish at base and having one or two other concealed bars of blackish; hind neck and interscapulary region brighter cinnamon, with central streaks of deeper cinnamon; wing-coverts cinnamon like the back, but the margins to the feathers broader and the black subterminal margins more pronounced; quills rufous for two thirds of their length, brown for the terminal third, the secondaries browner, the inner web almost entirely brown, the outer one mottled with the same externally, the innermost deep cinnamon, like the back, with the same distinct margins; tail brown, slightly tipped with rufous, the two outer feathers externally margined with creamy buff, the outermost more broadly, the two centre tail-feathers cinnamon, dark brown in the centre, from which radiate several imperfectly formed bars and mottlings of blackish; lores and a fairly distinct eyebrow buffy white; ear-coverts rufous, deeper on the hinder margin; cheeks and sides of neck buffy white, minutely speckled with dark brown; throat buffy white, unspotted; rest of under surface pale fawn-colour, rather obscured in some places by fulvous margins to the feathers, the fore neck and chest numerously marked with little round spots of black; under wing-coverts deep cinnamon, like the inner lining of the wing; "bill pale, with the tip dusky; tarsi and feet pale dusky; iris light tawny" (*Ayres*). Total length 6·3 inches, culmen 0·6, wing 3·35, tail 2·6, tarsus 1·05.

Young. Similar to the adult, but far deeper cinnamon, and everywhere barred with black wavy lines on the upper surface, the head included; tail with a broad centre of ashy brown, followed by another subterminal line along the apical portion of the feather, this line evidently breaking up into the radiations from the shaft which are seen in the tail-feathers of the adult; ear-coverts cinnamon, thickly spotted with black; under surface of body isabelline, the throat with a few concealed brown bars, the flanks and thighs deeper rufous slightly mottled with brown barrings, the chest much deeper cinnamon, especially on the sides; the latter being slightly varied with blackish wavy lines, the centre of the chest sparsely spotted with blackish. Total length 5·8 inches, culmen 0·6, wing 3·0, tail 2·35, tarsus 1·0.

Hab. The northern districts of the Cape colony, ranging into the Transvaal.

This species is nearly allied to *M. apiata*, which it resembles in its radiated tail and peculiar mottled plumage. It is, however, not the same bird, but a distinct species, distinguished by its general cinnamon-coloured appearance and rufous head, but particularly by its red wings, the cinnamon-colour occupying the basal two thirds of both webs, and not being confined to the basal portion of the outer web, as in *M. apiata*. In size the two species appear to be very similar.

Specimens examined.

E mus. R. B. S.:—juv. Transvaal (*T. Ayres*).

E mus. T. E. Buckley:—*a*, ♂ ad. Orange Free State, June 5, 1873 (*T. E. B.*).

E mus. H. B. Tristram:—*a*, ad. Colesberg (*Arnot*). *b*. Colesberg (*Ortlepp*). *c*. Transvaal (*Ayres*).

15. MIRAFRA AFRICANA.

Mirafra africana, Smith, Report Exp. S. Afr. App. p. 47 (1836); id. Ill. Zool. S. Afr. Aves, pl. lxxxviii. fig. 1 (1849); Bianc. Spec. Zool. Mosamb. fasc. xviii. p. 327 (1867).

Alauda planicola, Licht. Verz. Vög. Kafferl. p. 14 (1842, *descr. nullâ*); Giebel, Thes. Orn. p. 299 (1872).

Megalophonus africanus, Gray, Gen. B. ii. p. 382 (1844); Layard, B. S. Afr. p. 213 (1867).

Megalophonus occidentalis, Hartl. Orn. W. Afr. p. 153 (1857); Bocage, Jorn. Lisb. ii. p. 48 (1868).

Megalophonus rostratus, Hartl. Ibis, 1863, p. 327, pl. ix.; Layard, B. S. Afr. p. 212 (1867).

Megalophonus planicola, Finsch & Hartl. Vög. Ostafr. p. 463 (1870); Gray, Hand-l. B. ii. p. 122 (1870); Ayres, Ibis, 1871, p. 259.

Alauda africana, Sharpe, Cat. Afr. B. p. 71 (1871); Buckley, Ibis, 1874, p. 384.

Adult male in summer plumage. Above light fawn-brown, all the feathers with a distinct blackish shaft-streak down the centre and margined with ashy fulvous; the rump slightly more ashy than the back, narrowly streaked with brown; the upper tail-coverts shading off into light fulvous and having dark brown shaft-stripes; wing-coverts fawn-colour, darker brown in the centre of the feather, margined with fulvous and streaked with dark brown along the shaft, the greater coverts light rufous towards their tips; primary coverts rufous fawn, with narrow whitish margins; quills rufous fawn, gradually shading off into dark brown, which occupies about the terminal third of the quills, which are margined with ashy white or fawn-colour: the secondaries brown, washed with fawn-colour externally, and broadly margined and tipped with ashy buff; tail dark brown, the feathers margined with ashy buff, especially the two centre ones, which are rufous fawn at base, extending some way up the margins of the feathers, a shade of the same colour extending over the other feathers near their base, the outer feather creamy buff on the outer web, the penultimate one narrowly margined externally with the same colour; crown of head bright fawn-colour, with a few narrow shaft-lines of dark brown, the forehead minutely streaked, giving it a certain obscurely mottled appearance; lores and a rather broad eyebrow buffy white, as also the sides of the face, the cheeks and ear-coverts minutely spotted with dark brown, the ear-coverts washed with rufous, and inclining to dark brown on their upper margin; throat white, the rest of the under surface isabelline buff, washed with bright fawn-colour, minutely spotted with dark brown on the lower throat and chest, and streaked with the same on the sides of the breast; under wing-coverts entirely rich fawn-colour, a little brighter than the inner lining of the wing, which is rufous and very conspicuous; "upper mandible dusky, lower mandible pale; tarsi and feet pale; iris light hazel" (*Ayres*).

Total length 7 inches, culmen 0·8, wing 4·0, tail 3·0, tarsus 1·3.

Adult female. Smaller than male, and with a much thinner bill.

Total length 6·8 inches, culmen 0·75, wing 3·5, tail 2·7, tarsus 1·2.

Winter plumage. Much darker brown than in summer, and not nearly so rufous on the upper surface, the rufous of the crown entirely obscured by the broad dark-brown shaft-stripes, and the forehead entirely brown, shaded with ashy and slightly tinged with rufous; the hinder back and rump decidedly shaded with ashy; below rather more richly coloured than in summer, the breast largely marked with triangular spots of dark brown; hind neck decidedly more ashy, separating the head from the back.

Young. Obscure brown, with hardly any rufous shade above; the hind neck washed with ashy fulvous; all the feathers very broadly black in the centre, and subterminally barred with a crescentic black line, very conspicuous before the fulvous tips to the feathers, more distinct on the wing-coverts, which incline to light fawn-colour; quills much as in adult, and rufous at base, the inner secondaries dark brown, with a distinct ashy whitish margin, before which runs another subterminal line of black; tail brown, shaded with ashy on the margins of the feathers, the external web of the outer tail-feather creamy white, the penultimate one broadly margined with the same; over the eye a broad superciliary streak of creamy buff; lores and sides of face buffy white, the cheeks thickly spotted with black, the ear-coverts washed with rufous; throat white, with a few tiny specks of brown on the lower part; rest of under surface isabelline fulvous, the breast washed with fawn rufous and mottled with rufous-brown bars, some of the new triangular-spotted feathers just appearing.

Hab. The eastern districts of the Cape colony, ranging from Natal and the Transvaal into Damara Land.

Specimens examined.

E Mus. Brit.:—*a*, ad. South Africa (*F. Campbell*). *b*, *c*. South Africa (*Sir A. Smith*). *d*, ♀ ad. Cape of Good Hope. *e*, *f*, *g*, ♂ ♀. Natal (*Ayres*). *h*, *i*, ♂. Elephant Vley, Damara Land, Nov. 12th & 29th, 1859 (*C. J. Andersson*).

E Mus. R. B. S.:—*a*, juv. Eland's Post, March 15th, 1870 (*T. C. Atmore*). *b*, *c*, *d*, ♂ ♀. Eland's Post (*T. C. A.*). *e*, ♂. Eland's Post, June 1870 (*T. C. A.*). *f*, ♂. Transvaal (*Ayres*).

E Mus. H. B. Tristram:—*a*. Natal (*Ayres*).

16. MIRAFRA CHENIANA*.

Megalophonus chenianus, Gray, Gen. B. ii. p. 382 (1844); Bp. Consp. i. p. 244 (1850); Layard, B. S. Afr. p. 214 (1867, *ex* Smith); Ayres, Ibis, 1871, p. 259.

Mirafra cheniana, Smith, Ill. Zool. S. Afr. Aves, pl. 89. fig. 2 (1848, *err. pro* fig. 1).

Alauda cheniana, Giebel, Thes. Orn. p. 293 (1872).

Adult (type of species). Above dark brown, almost blackish, the feathers margined with sandy rufous, especially broad on the hind neck, some few of the scapular feathers with narrow fulvous tips; wings rufous, the coverts having dark brown bases, the greater series dark brown, margined with rufous, shading off into fulvous on extreme edge; quills dark brown, with very broad rufous margins, the edges of the secondaries more fulvous; upper tail-coverts dark brown, with ashy fulvous margins; tail dark brown, the two centre feathers margined with rufous, shading off into fulvous towards the tips; the two outermost feathers pure white, with a touch of brown near the base of the outer, but occupying the half of the inner web of the penultimate feather for all its length, as well as a short distance towards the end of the shaft; feathers above and below the eye, forming a distinct eyebrow, creamy buff; ear-coverts rufous, slightly mottled with dark brown, as also are the cheeks and sides of the neck, which are white; throat white, unspotted; rest of under surface creamy buff, strongly inclining to rufous on the chest, which is marked with triangular spots of dark brown, inclining to streaks on the sides of the breast; flanks and thighs washed with rufous; under tail-coverts buffy white; under wing-coverts deep rufous; inner lining of wing ashy brown, inclining to rufous on the inner web; "upper mandible deep brownish red, lower mandible deep sienna-yellow; legs, toes, and claws pale buff-orange, tinged with flesh-red" (*Sir A. Smith*), "iris dark brown" (*Ayres*). Total length 5·3 inches, culmen 0·5, wing 2·85, tail 2·9, tarsus 0·9.

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* The name of *Alauda cheniana*, Smith (Report Exp. S. Afr., App. p. 46), probably refers to this species, but was afterwards suppressed by that author. The description, however, is scarcely good enough to allow of a strict identification, and it seems best to acquiesce in the wishes of Sir Andrew Smith, and suppress the title (cf. Newton, Ibis 1868, p. 270; Layard, *op. cit.* 1869, p. 78).

Adult male. Total length 5·0 inches, culmen 0·5, wing 2·85, tail 2·0, tarsus 0·9.

Hab. Eastern portions of the Cape colony, ranging into the Transvaal.

Sir Andrew Smith, in describing the type as a male, writes as follows:—"A second adult specimen of this species was obtained, but its sex was not recorded. In size it was rather superior to the male specimen just described; and the feathers of the upper parts are broadly edged with a colour intermediate between orpiment and reddish orange: the latter colour on the breast is also much darker: in other respects the two are similar."

Both specimens referred to by Sir Andrew are in the collection still; and the one I have described is the "larger" bird; but, as will be seen by the measurements, the difference in size is more apparent than real, as the specimen is a little overstuffed.

I have not yet seen the winter plumage of this bird, and have only one male specimen in my collection, sexed by Mr. Atmore, and measuring 2·95 in the wing and 0·9 in the tarsus.

Specimens examined.

E mus. Brit.:—*a*, *b*, ♂ ad. South Africa (*Sir A. Smith*, types of species).

E mus. R. B. S.:—*a*, ♂ ad. Whittlesea Flats, South-east Africa (*T. C. Atmore*).

E mus. H. B. Tristram:—*a*, ♂. Transvaal (*Ayres*).

17. MIRAFRA SABOTA.

Mirafra sabota, Smith, Rep. Exp. S. Afr. App. p. 47; id. Ill. Zool. S. Afr. *Aves*, pl. 89. fig. 2 (1849, *err. pro* fig. 1).

Megalophonus sabota, Gray, Gen. B. ii. p. 382 (1844); Bp. Consp. i. p. 244 (1850); Layard, B. S. Afr. p. 213 (1867, *ex* Smith); Gray, Hand-l. B. ii. p. 122 (1870).

Megalophonus chenianus, Gray, Hand-l. B. ii. p. 122 (1870).

Megalophonus nævius, Ayres, Ibis, 1871, p. 259.

Alauda sabota, Giebel, Thes. Orn. p. 300 (1872).

Alauda nævia, Buckley, Ibis, 1874, p. 283.

Adult male. Above sandy fawn-colour, with distinct mesial centres of blackish brown to all the feathers, more closely mottled on the head, which appears in consequence rather darker than the back; the hind neck distinctly washed with ashy fulvous, slightly separating the head from the back; wing-coverts dark brown in the centre, with broad fawn-coloured margins, shading off on the extreme edge into fulvous, the edge of the wing whitish, and the primary coverts dull ashy brown, distinctly edged and tipped with white; quills dark brown, the primaries narrowly margined with sandy buff and tipped with whitish, the secondaries broadly edged with fawn-colour exactly like the wing-coverts; rump coloured like the back; upper tail-coverts dark brown, tipped and margined with fulvous, and washed with fawn-colour near the base; tail-feathers blackish, distinctly margined with sandy fawn-colour and tipped with whitish, the margins of the two centre feathers and the external one the broadest; a very distinct eyebrow white; feathers in front of the eye blackish, with a line of white feathers under the latter; ear-coverts sandy fawn-colour, darker at the upper margin, and streaked with fulvous; cheeks buffy white, spotted with black, and forming a moustache on each side of the throat, which is buffy white and unspotted, excepting a few blackish spots on the lower part; rest of the under surface isabelline sand-colour, the chest plainly covered with triangular spots of dark brown, some of the spots inclining to rufous; sides of the body streaked, and the flanks washed with sandy rufous; under wing-coverts ashy, with broad whitish margins, some of them washed with sandy colour; the inner lining of wing light ashy brown, inclining to pale isabelline near the base of the inner web; "upper mandible and tip of lower one light reddish brown, rest of the lower one sienna-yellow; legs, toes, and claws sienna-yellow, tinted with flesh-red; claws faintly shaded with light reddish brown" (*Sir A. Smith*). Total length 5·8 inches, culmen 0·55, wing 3·3, tail 2·4, tarsus 0·9.

Adult female. Similar to the male. Total length 5·5 inches, culmen 0·6, wing 3·25, tail 2·25, tarsus 0·9 (*mus. H. B. Tristram*).

Hab. North-eastern districts of the Cape colony, ranging into the Transvaal.

The summer plumage is different from the winter dress only in being much darker by reason of the absence of light margins to the feathers of the upper surface, which is also much more rufous; underneath the chest is washed with rufous, and the black spots are more distinct; the inner lining of the wing is also deeper and more leaden grey.

Specimens examined.

E mus. Brit.:—*a.* South Africa, lat. 54° (*Sir A. Smith*). *b, c.* South Africa (*Sir A. Smith*). *d,* ♂ ad. Transvaal, July 10th, 1873 (*T. E. Buckley*).

E mus. R. B. S.:—*a,* ♂ ad. Transvaal (*T. Ayres*).

E mus. H. B. Tristram:—*a, b, c,* ♂ ♀. Transvaal (*Ayres*).

18. MIRAFRA NÆVIA.

Alauda nævia, Strickl. Contr. Orn. 1852, p. 152; Gray, Hand-l. ii. p. 118 (1870); Sharpe, Cat. Afr. B. p. 72 (1871); Giebel, Thes. Orn. p. 298 (1872).

Alauda sabota, Giebel, Thes. Orn. p. 300 (1872).

Megalophonus sabota, Gurney, in Anderss. B. Dam. Ld p. 195 (1872).

Megalophonus nævius, Gurney, *t. c.* p. 199 (1872).

Adult male in summer plumage. Above sandy rufous, with dark brown centres to the feathers, the head with rather paler sandy margins; the hind neck distinctly inclining to ashy, and separating the head from the back; scapulars blackish in centre, with very broad margins of sandy rufous on each side; wing-coverts coloured like the back, with concealed blackish centres to the feathers, which are margined with sandy, shading off into fulvous on the extreme edge, the greater series more broadly margined, the primary coverts more narrowly; quills blackish, the primaries narrowly tipped with greyish white and margined externally with sandy rufous, the secondaries much more broadly, and bordered with fulvous on their extreme edge; upper tail-coverts sandy rufous, inclining to brown in the centre of the feathers, and narrowly tipped with greyish buff; tail black, very narrowly margined and tipped with sandy buff, the centre feathers broadly margined with sandy rufous, the outermost externally margined with a narrow edging of light sandy colour, changing to white at extreme tip: lores and a tolerably plain eyebrow isabelline; feathers in front of the eye dusky, those under it isabelline, and marked with blackish; ear-coverts dark brown, very plainly and regularly streaked with sandy buff; throat and cheeks white, the latter washed with isabelline on the chest and sides of the body, the lower throat and chest plainly spotted with triangular markings of light brown; under wing-coverts ashy brown, the innermost washed with sandy, the inner lining of the wing entirely ashy brown also, excepting the base of the inner web, which inclines to sandy; "iris hazel" (*T. C. Atmore*). Total length 6·5 inches, culmen 0·75, wing 3·5, tail 2·6, tarsus 0·95.

Adult female. Rather smaller than the male. Total length 5·7 inches, culmen 0·65, wing 3·4, tail 2·3, tarsus 0·9.

Winter plumage. I have four specimens in my own collection in full winter plumage, which does not differ so much on the upper surface as in some of the South-African Larks. It is much more mealy and of a paler sand-colour, the grey collar round the hind neck being very distinct, as well as the white eyebrow and the margins to the wing-coverts and quills; under surface of body white, tinged with isabelline on the chest, flanks, and thighs, the chest with a few narrow streaks of pale brown, the entire lining of the wing ashy, as also the wing-coverts, some of which are margined with sand-colour.

Hab. From the north-eastern districts of the Cape colony (summer), ranging into Damara Land (winter).

This species is a large edition of *A. sabota*, to which it can hardly be united by reason of its enormous bill.

In other respects it agrees very fairly, especially in the lead-coloured wing-lining. Some mistake may have arisen in the sexing of the specimens, and a large series carefully collected will perhaps rejoin the two species. As will be seen, however, by the specimens which I have, the material at my disposal is tolerably conclusive.

Specimens examined.

E mus. R. B. S.:—*a*, *b*, *c*, ♂ æstiv. Griqualand (*T. C. Atmore*).

d, *e*, ♂ ♀. Objimbinque, Damara Land, July 30th & 31st, 1866 (*C. J. Andersson*). *f*, ♀. Objimbinque, Aug. 4th, 1866 (*C. J. A.*). *g*, ♂. Ombujavahami, July 6th, 1866 (*C. J. A.*).

E mus. Brit.:—*a*, ♀ ad. Koonguip River, Great Namaqua Land, July 12th, 1871 (*C. J. A.*). *b*, ♂ ad. Hountop River, Great Namaqua Land, June 3rd, 1862 (*C. J. A.*).

E mus. H. B. Tristram:—*a*, ♂. Objimbinque, July 16th, 1866 (*C. J. A.*). *b*, ♂. Ombujavahami, July 8th, 1866 (*C. J. A.*).

19. MIRAFRA AFRICANOIDES.

Mirafra africanoides, Smith, Rep. Exp. S. Afr. p. 47 (1836); id. Ill. Zool. S. Afr. pl. 88. fig. 2 (1849).

Megalophonus africanoides, Gray, Gen. B. ii. p. 382 (1844); Bp. Consp. i. p. 244 (1850); Layard, B. S. Afr. p. 214 (1867); Gray, Hand-l. B. ii. p. 122 (1870); Gurney in Anderss. B. Dam. Ld. p. 198 (1872).

Alauda africanoides, Sharpe, Cat. Afr. B. p. 71 (1871); Giebel. Thes. Orn. p. 290 (1872).

Adult (type of species). Above sandy rufous, with narrow black shaft-stripes to the whole of the upper surface, the neck very slightly inclining to greyish; wing-coverts dark brown, with narrow blackish shaft-stripes, margined with sandy rufous, inclining to fulvous on the extreme edge of the feathers; primary coverts dark brown, with broad margins of sandy rufous; quills ashy brown, rufous on the outer web and very conspicuous, the inner web also rufous, but separated for the entire length of the quill by the dark brown of the shaft, the secondaries ashy brown, especially the innermost, which are distinctly shaded with grey, all margined with sandy colour; upper tail-coverts pale ashy brown, broadly washed with whity brown; tail dark brown, the middle feathers washed with clear grey and broadly margined with sandy rufous, the others narrowly and almost imperceptibly edged with pale sandy, the outermost narrowly bordered with whitish for the whole length of the outer web; lores and feathers round the eye whitish, as well as a distinct eyebrow; feathers in front of the eye dusky; ear-coverts bright sandy rufous; cheeks, throat, and underparts generally whitish, washed with sandy isabelline on the chest, the cheeks with a few indistinct dusky spots, the chest sparsely marked with triangular spots of dusky black; under wing-coverts entirely rufous, as also the greater part of the inner web of the quills; "bill yellowish brown, shaded on culmen with brownish red; tarsi and toes sienna-yellow, brightened with flesh-red; iris light chestnut" (*Sir A. Smith*).

Total length 6·5 inches, culmen 0·6, wing 3·65, tail 2·7, tarsus 1·1.

The above description is taken from the type specimen, which is still in the Museum, but appears rather worn. I have, however, examples in both summer and winter plumages, which are not very different. In the latter dress the bird is much more mealy and sandy, whereas in summer it is bright fawn-colour; the chest also is more plainly spotted in summer, and the thighs are deep fawn-colour. In winter there are scarcely any pectoral markings. The following are the measurements of a pair of birds, the male collected by Mr. Andersson, and the female by Mr. Atmore.

	Long. tot. in.	culmen. in.	wing. in.	tail. in.	tarsus. in.
a, ♂ ad., Damara Land ..	6·7	0·6	3·7	2·85	0·9
b, ♀ ad., Hope Town	5·7	0·55	3·45	2·5	0·9

I have remeasured the type and found that the tarsus (whether out of shape I cannot say) is 1·1 inch in length, as Sir A. Smith also states.

Young. Resembles the summer plumage of the adult, being rich fawn, the central dark brown markings being very broad, and each feather being tipped with lighter fawn-colour producing the usual varied appearance of a young Lark. The cheeks, throat, and chest are very thickly mottled with black, the spots very minute on the two former but much larger and blotch-like on the chest.

Hab. From the northern and north-eastern districts of the Cape colony (summer), ranging into Damara Land (winter).

Specimens examined.

E mus. Brit.:—*a*, ad. South Africa (*Sir A. Smith*). *b*, *c*. South Africa (*Sir A. Smith*). *d*, *e*. South Africa. *f*, *g*, *h*, ♂ ♀. Elephant Vley, Damara Land, August 26, Sept. 14, Nov. 20, 1859 (*C. J. Andersson*).

E mus. R. B. S.:—*a*, ♀ ad. Hope Town (*T. C. Atmore*). *b*, ♂ juv. Griqua Land (*T. C. A.*). *c*, *d*. Otjimbinque, Damara Land, June 12 and 15, 1866 (*C. J. Andersson*). *e*. Ondonga, Ovampo Land, Oct. 30, 1866 (*C. J. A.*).

E mus. H. B. Tristram:—*a*. Colesberg (*Ortlepp*). *b*, *c*, ♂. Otjimbinque, July 10, 1866 (*C. J. A.*). *d*. Otjuvahami, July 12, 1866 (*C. J. A.*).

20. MIRAFRA FRINGILLARIS. (Plate LXXV. fig. 1.)

Alauda fringillaris, Sundev. Œfv. Vet. Akad. Förh. Stockh. 1850, p. 99.

Mirafra occipitalis, Gray, Hand-l. B. ii. p. 121 (1870, *err.*).

Adult. Above dusky brown, the feathers margined with ashy buff, but the general character of the upper surface more dingy than in most other Larks, some of the back-feathers washed with fulvous; wing-coverts dull brown, narrowly margined with fulvous, the greater series with rufescent margins, especially at the tip; quills dark brown, the primaries with broad rufous margins narrowing towards the tip, the secondaries with ashy fulvous edgings; lower back, rump, and upper tail-coverts dull brown, slightly varied with ashy fulvous margins; tail dark brown, the central feathers paler and plainly margined with fulvous, the other feathers less plainly edged, the penultimate one broadly margined with white on outer web, the outermost feather white at base, but obliquely white for more than the terminal half; lores and a distinct eyebrow sandy buff; ear-coverts rufous, spotted with dark brown, especially on the hinder margin; cheeks, throat, and sides of neck buffy white; rest of under surface creamy buff washed with isabelline on the chest, which is thickly spotted with dark brown, a few spots of which colour extend on to the throat; under wing-coverts isabelline, resembling the inner lining of the quills, with a few spots of brown on the carpal edge of the wing; "beak horn-coloured; legs sienna; iris hazel" (*T. E. Buckley*). Total length 5·8 inches, culmen 0·6, wing 3·1, tail 2·5, tarsus 0·85.

Hab. From Caffraria and the Transvaal to Damara Land.

This species is closely allied to *M. cheniana*, but is a much larger bird, and has not the red borders to the wing-coverts, nor is it so richly coloured. The white border does not extend on to the inner web of the penultimate tail-feathers in the present species, whereas in *M. cheniana* it extends to the inner web of the penultimate and even forms a border to the third feather.

Specimens examined.

E mus. R. B. S.:—*a*, *b*. Damara Land (*C. J. Andersson*).

E mus. T. E. Buckley:—*a*, ♂. Transvaal, Nov. 29, 1873 (*T. E. B.*).

E mus. H. B. Tristram:—*a*, *b*. Damara Land (*C. J. Andersson*).

21. MIRAFRA DAMARENSIS, sp. n. (Plate LXXV. fig. 2.)

Adult male in winter plumage. Above sandy grey, slightly washed with fulvous and having a distinct shade of ashy grey on the margins of the feathers; the upper surface narrowly streaked with black shaft-lines, rather broader and more distinct on the crown; the hind neck inclining to ashy, the streaks much more minute; wing-coverts like the back but rather paler by reason of distinct whitish grey margins to the feathers, which have also central streaks or markings of bright fawn, many of the greater coverts washed with the latter colour before the whitish margin; quills dark brown, externally shaded with ashy buff, broader and clearer grey on the secondaries; the outer aspect of the wing rufous, this colour extending right across the primaries, of which it occupies *quite two thirds*, and traverses also the basal part of the secondaries; lower back and rump sandy grey, like the back, with scarcely any shaft-streaks, more distinct on the upper tail-coverts, which have distinct ashy white margins; tail blackish brown, all the centre feathers distinctly shaded with bluish grey and margined with whitish ash-colour, shading off into white at the tips, the three external feathers bordered and tipped with white, this colour occupying the entire web of the outermost feather; lores, a distinct eyebrow, and sides of the face white; the ear-coverts sandy, with indistinct white streaks; throat white, unspotted; rest of under surface creamy white, with a tinge here and there of sandy isabelline, the chest with numerous minute specks of dark brown; thighs buff washed with sandy; under wing-coverts entirely rufous, like the inner lining of the quills, this colour occupying the base of *both* webs. Total length 5·5 inches, culmen 0·65, wing 3·45, tail 2·4, tarsus 1·1.

Another specimen is rather clearer and more bluish grey above, the central streaks darker and plainer, the spots on the chest a little larger and more distinct. Total length 5·4 inches, culmen 0·6, wing 3·35, tail 2·15, tarsus 1·0. This is probably the female bird.

Hab. Ovampo Land.

Specimens examined.

E mus. R. B. S. :—*a*, ♂. Ondonga, Ovampo Land, Nov. 14, 1866 (*C. J. Andersson*). *b*. Ondonga, Oct. 20, 1866 (*C. J. A.*).

18. SPIZALAUDA.

Type.

Spizalauda, Blyth, J. A. S. B. xxiv. p. 258 (1855) .... *S. deva.*

The principal character of this genus is its enormous crest.

19. OTOCORYS.

Type.

Eremophila, Boie, Isis, 1828, p. 322 (*nec* Humb. 1805) .... *O. alpestris.*

Phileremos, Brehm, Vög. Deutschl. p. 312 (1831, *nec* Latr. 1809) .... *O. alpestris.*

Otocoris, Bp. 1839 (teste Gray, *infra, sed ubi?*).

Philamnus, Gray, List of Gen. 1840, p. 47 .... *O. alpestris.*

This genus is very easily distinguished by its ear-tufts.

The only species of Lark from South Africa which I have not seen, and consequently have been unable to include, is the following,

MIRAFRA NIGRICANS.

Alauda nigricans, Sund. Œfv. K. Vet. Acad. Förh. Stockh. 1850, p. 99.

Mirafra nigricans, Gray Hand-l. ii. p. 121 (1870).

The following is a translation of Professor Sundevall's original description.

Dusky blackish; underneath white, the breast spotted with black; the orbits and elongated eyebrows white; the stripes on the throat, cheeks, and lores black. 8 inches long, wing 4·8, tarsus 1·25, middle toe 0·75, with nail 0·9. Bill tolerably large for a Lark; nostrils bare, with an arched membrane. Feet raised, as in most African Larks; all the claws short; that of the hind toe less than an inch, curved. Tail moderate, entirely black (in our specimens injured). Quills black, the primaries invariably broadly fulvous. Our male specimens, killed during moult, are varied above with some feathers waved with pale rufous, the wing-coverts edged with white.

Hab. The district of the Limpopo in Upper Caffraria.

3. Note on *Macacus brunneus*. By JOHN ANDERSON, M.D.

[Received October 9, 1874.]

In the Natural-History gallery of the Jardin des Plantes I have examined the type of *Macacus arctoides*, Geoff. St.-Hil., and compared it with a specimen of my *M. brunneus*, either received or purchased from the Zoological Society of London by the Paris Museum, and an undoubted example of the species described by me (P. Z. S. 1871, p. 628) under that name.

After examination of these two monkeys I am in a position to state that they are remarkably dissimilar and therefore belong to two well-defined species. The sex of the type of *M. arctoides* is not stated; but the species seems to be more like *M. nemestrinus* and *M. leoninus* than *M. brunneus*, which is more closely affine to *M. speciosus* of Japan, a specimen of which, from the Leyden Museum, I have also compared with the two former species.

The original description of *M. arctoides* by Geoffroy St.-Hilaire seemed so inapplicable to *M. brunneus* that I had anticipated that the comparison of the types would confirm the fact that that they are two distinct species, and that Dr. Sclater* and Dr. Murie† had therefore erred in regarding them as one and the same.

4. Description of a New Trogon of the Genus *Pharomacrus*.

By HERCULES, Count TURATI, and T. SALVADORI, C.M.Z.S.

[Received October 21, 1874.]

PHAROMACRUS XANTHOGASTER, sp. nov.

P. *splendide aureo-viridis, uropygio magis virescente, dorso et supracaudalibus longioribus magis aurescentibus; capite toto pulchre cupreo-aurato resplendente; tectricibus alarum, caudæque superioribus valde productis, his caudæ apicem paulo superantibus; remigibus rectricibusque nigerrimis; abdomine pulcherrime flavo-aurantiaco; tibiis nigris; rostro flavo; pedibus fuscis.*

Long. tot. 360 millim.; al. 210; caud. 185; rostri culm. 22; tarsi 19.

We have lately seen a single skin of this splendid bird, which is now preserved in Turati's collection. On the original label attached to it was written *Cogiiai amarillo, macho.* It was sent as from Columbia; and judging from the making of the skin, flat, hard, and filled with moss, we have but little doubt that it really comes from Bogota.

From all the other previously known species of the genus *Pharomacrus* this is easily distinguished by the *beautiful orange-yellow abdomen*; it has a black tail like *P. pavoninus* and *P. auriceps*, and has a yellow bill like the last-named species, which it also resembles in the colour of the upper parts; the head is perhaps a little more greenish, very much like that of *P. fulgidus*; its dimensions are intermediate between those of *P. auriceps* and *P. fulgidus*.

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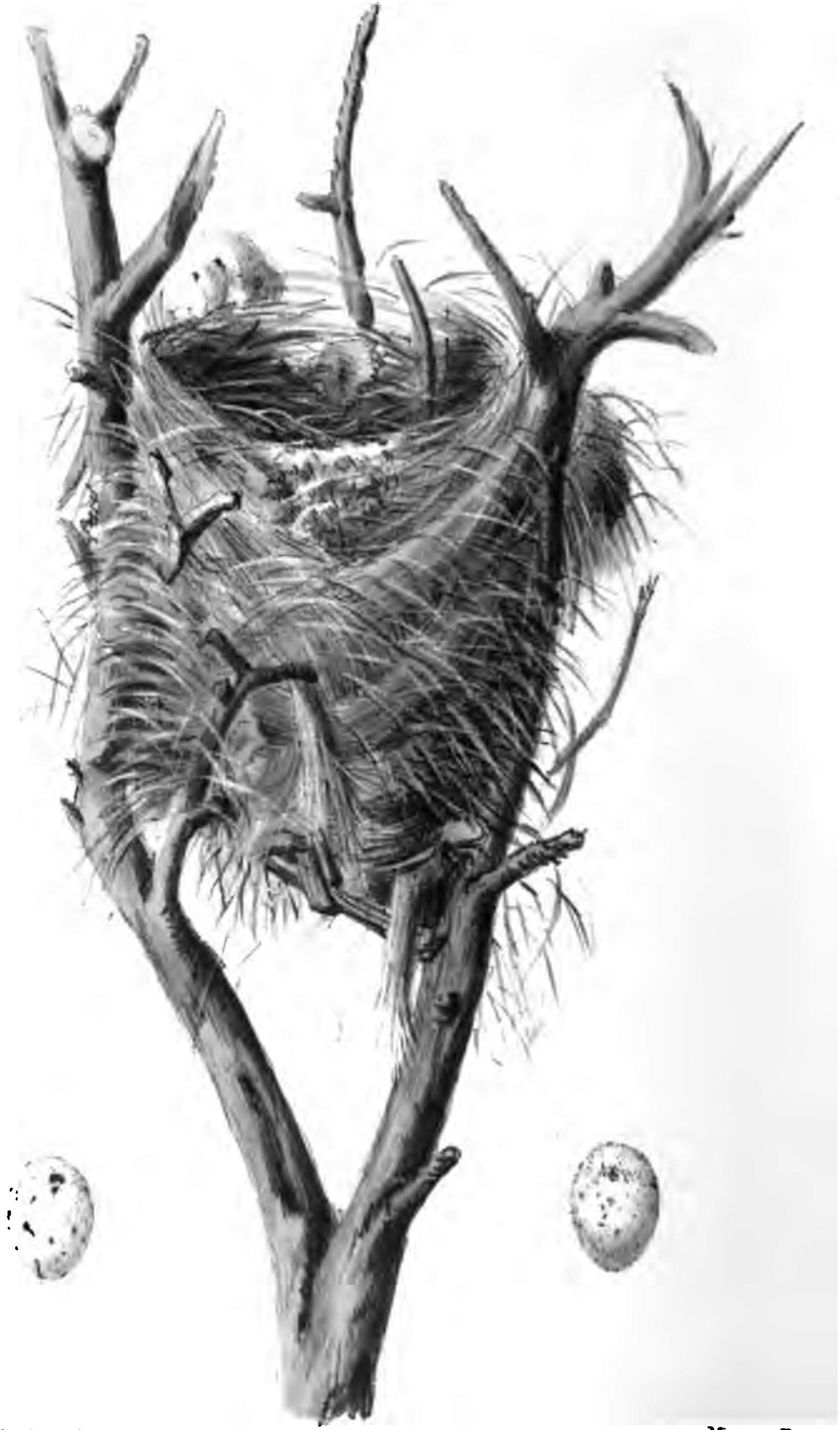
* P. Z. S. 1872, p. 203.

† P. Z. S. 1872, p. 770.



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NEST AND EGG OF HYPOLAIS RAMA.

Golden Wolf; but whether it was a light-coloured specimen of the common Chanko or a different variety I am unable to say"*.

I propose, therefore, for the future to designate the Black Wolf of Thibet *Canis niger*, and to restrict the term *Canis laniger* to the grey form, to which Hodgson originally applied it.

In the Appendix to the Mammals of Thibet (p. iii.) Dr. Jerdon has referred to the existence of this animal.

The Black Wolf of Thibet is readily distinguishable from every other species of *Canis* known to me by its nearly uniform black shaggy fur. The muzzle, feet, and a patch on the breast are white. The height of our specimen is about 2 feet 5 inches; the length of the body from the nose to the tail 3 feet 4 inches, that of the tail 1 foot 4 inches. The two examples received were alike in every respect; and the young male which attained full age was also similar. I think, therefore, that this singular form can hardly be only a variety of the Common Wolf, which, however, may be the case with Hodgson's *Lupus laniger*†.

7. On the Nest and Eggs of *Hypolais rama* (Sykes).

By H. E. Dresser.

[Received November 3, 1874.]

(Plate LXXIX.)

Though far from believing that eggs alone are of any great use in discriminating birds generally, I think that no one who has at all studied them will deny that they are of great secondary importance, and that, where other characters are but slightly defined, the eggs and nests of tolerably closely allied species or genera frequently differ so widely and constantly as to form a very clear distinctive character. I may, for instance, name *Acrocephalus streperus* and *Acrocephalus palustris*, which are so exceedingly difficult to separate from dried skins alone, though in life the colour of the tarsus is said to be invariably different; but their eggs differ so constantly and greatly that they cannot possibly be mistaken. The various species belonging to the *Hypolais* group also are clearly distinguishable from the different allied species by their nest and eggs; and though some of the species belonging to that group approach so nearly in form and coloration others of the *Arocephalus* group, still their eggs alone show that they belong to the former. Mr. Blanford has lately brought from Persia the nest and eggs of *Hypolais rama*, which clearly show that this bird is a true *Hypolais*, nearest to *Hypolais pallida*, Ehr. (*H. elaica*, auctt.).

Curiously enough, however, the eggs of this species, which I am am enabled by the kindness of Mr. Blanford to exhibit, have in general characters a slight tendency towards those of *Acrocephalus palustris*, and are thus the more interesting as demonstrating a gradation from *Hypolais* to *Acrocephalus*. They are also interesting because, *Hypolais rama* being so very closely allied to the rare *Hypolais caligata* of eastern Europe, differing merely in the size of the bill, it may be inferred that the eggs of these two species will probably closely resemble each other.

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* It is probably on a skin of this variety that *Canis chanco*, Gray, P. Z. S. 1863, p. 94, was established.

† This species was described by Mr. Hodgson in 1847, in the 7th volume of the 'Calcutta Journ. of Nat. Hist.' (p. 474). Under the same name, in the same year, Mr. Blyth notices (J. A. S. B. xvi. pt. 2, p. 1176) an imperfect skin of a "blackish or melanoid variety of the Thibetan Wolf" received from Lieut. Strachey by the Calcutta Museum.

I have for long tried to obtain authentic eggs of a species which appears to form a connecting link between *Acrocephalus* and *Hypolais* in structure and habits, but has hitherto been classed with the former, *Acrocephalus dumetorum*, Blyth (*magnirostris*, Lilj.), the eggs of which I believe will be found to resemble either those of *Acrocephalus palustris* or to approach nearer to those of some of the *Hypolais* group. Dr. Jerdon (B. of India, ii. p. 156) describes them as [illegible] with minute scattered specks of rufous, chiefly at the large end; but as he himself never obtained the nest, there is some doubt as to whether these really were the eggs of this species, especially as he describes the eggs of *Hypolais rama* as being pure white.

There can be no doubt about the authenticity of the eggs of this [illegible] obtained by Mr. Blanford, as he shot the female as she left her nest.

I am enabled to exhibit from my own collection eggs of all the European species of *Hypolais* except *H. caligata*, viz. those of *H. icterina*, *H. polyglotta*, *H. olivetorum*, *H. pallida*, *H. languida*, and *H. opaca*, from which it will be seen that there is a distinct gradation in the eggs as in the birds themselves towards *Acrocephalus*, the two nearest in each group being *Hypolais rama* and *Acrocephalus palustris*.

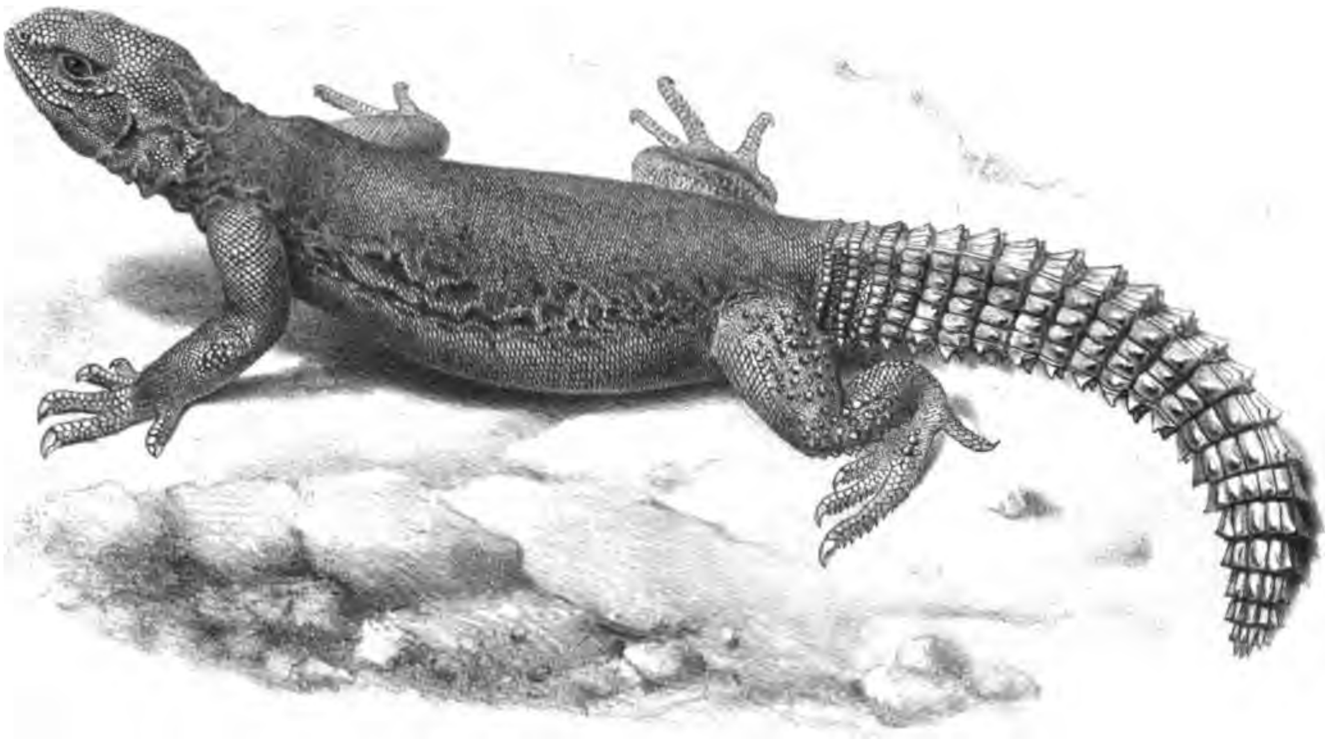
Unfortunately, the nest of eggs of *H. rama* which I now exhibit will leave this country in a few days; but I trust that the figure given of them (Plate LXXIX.) will serve to show their peculiar interest as demonstrating the gradation between the two groups.

8. Description of two Uromasticine Lizards from Mesopotamia and Southern Persia. By W. T. BLANFORD, F.R.S., F.Z.S.

[Received November 11, 1874.]

(Plate LXXX.)

I am indebted to the kindness of Mr. Sclater for an opportunity of examining the two very interesting Lizards described below. Both are, I think, new to science, although one of them appears to have been noticed as long ago as the latter end of the last century by Olivier, who in 1807 published an account of his travels in several eastern countries, under the title of 'Voyage dans l'Empire Othoman, l'Egypte et la Perse.' In this work, vol. ii. p. 428, a



J. Smit lith.

Hanhart imp.

UROMASTIX MICROLEPIS.

large Lizard is mentioned, which is said to inhabit Mesopotamia, to be longer and larger than a man's arm, and to make holes like those of Foxes. The description evidently refers to a *Uromastix*.

At the same time I had heard from Major St. John of a similar large Lizard which he had once seen abundantly in the plains near Bushire, and which he assured me closely resembled *Centrotrachelus asmussi*, the great Spine-tailed Lizard of Central Persia. I concluded that both these Lizards were probably identical; and as the species was unknown, I called Mr. Sclater's attention to their existence, in the hope that he might succeed in obtaining specimens. In this, I am happy to say, he has been successful. Of the Bushire Lizard a young example in spirit has been sent to him by the Hon. Evelyn Ellis, F.Z.S., who, after much trouble and inquiry, succeeded in inducing the natives to bring it to him ; whilst three of the Mesopotamian Lizard were brought from Basrah (Bussora of some maps) alive by Captain Phillips, and presented to the Society's Gardens, where they only lived for a short time. On examining these specimens, it appears that the Basrah animal is quite distinct from that of Bushire, the former being a true *Uromastix*, closely allied to the African *U. spinipes*, whilst the latter belongs to Strauch's genus *Centrotrachelus*, founded in 1863 (Bull. Acad. Sci. St. Pét. vi. p. 479) for the remarkable Central-Persian Lizard already mentioned. This genus is distinguished from *Uromastix* by the possession of much-enlarged tubercles in transverse rows on the back. The specimen from Bushire is very close to *C. asmussi*, but appears to me to differ specifically.

It appears rather surprising that two Lizards so large and conspicuous as these Uromasticine forms should have hitherto escaped attention. One cause may be that during the winter season these Lizards appear but rarely; and it is highly probable that they hibernate. Major St. John informs me that he has been all over the plains near Bushire in winter without seeing any *Centrotracheli*, but that he met with them once when riding from Shif, a small fort opposite Bushire, to Borasjún in May—the only occasion on which he had left the regular road in summer. The Lizards were sitting outside their holes in the evening; and a bull-terrier which was with him killed two, one of which attacked the dog. This is rather surprising; for all forms of *Uromastix* and its allies are very gentle animals, and, as a rule, never attempt to bite even when captured.

It is only during the winter that the hot sandy plains of Mesopotamia and Southern Persia are ever, as a rule, crossed by travellers in the day-time. In the summer months all travelling is usually done by night: at least, this is the practice of the inhabitants; and I know from experience how difficult it is to induce them to march in the day-time. All species of *Uromastix* appear to inhabit semidesert plains; and such are precisely the places which are hottest and most unpleasant to traverse in the day-time.

The species of *Uromastix*, *Centrotrachelus*, and *Liolepis* are distinguished from the other Agamoid Lizards by their peculiar incisors, and by their elongate intestines. They live entirely on vegetable food*, and all, so far as I am aware, dwell in holes. By Mr. Theobald (Journ. Linn. Soc. x. p. 31) they were placed in a family distinct from the *Agamidæ*†; and this view has been adopted by Dr. Stoliczka and Dr. Anderson; and they certainly form a very well-marked group.

UROMASTIX MICROLEPIS, sp. nov. (Plate LXXX.)

U. affinis U. spinipedi, sed tuberculis majoribus ad latera corporis sparsis carens, et plicis ad latera colli tubercula parva ferentibus, squamisque supra et infra pedes minoribus distinguendus; ab U. hardwickii squamis omnibus multo minoribus facile dignoscendus.

Hab. in Mesopotamia prope urbem Basrah (Bussora).

Description.—General form massive, trunk broad, depressed; head triangular, upper portion flat behind, descending in a curve towards the muzzle. Limbs rather stout; the fore foot laid forward extends beyond the snout by the length of the fingers; laid backward it reaches two thirds of the distance to the thigh; when the hind limb is brought forward, the ends of the toes nearly touch the axil. Toes strong, a fringe of pointed scales on the outer edge of the fourth toe of the hind foot, and less-marked fringes on the second and third toes. Claws rather long, pale-coloured. Tail thick, gradually diminishing in size behind, formed of rings of pointed conical tubercles, its length about equal to that of the body without the head and neck.

About eighteen subconical teeth on each side of the upper jaw, those in front smaller and much worn down; fifteen similar teeth, much blunted, on each side of the lower jaw. In front of the upper jaw is a cutting edge formed of a broad central portion, which appears to be a process of the outer maxillary bone, and two smaller lateral teeth, one on each side, apparently united to the central process at the base‡. Similarly in front of the lower jaw are two cutting edges, one at the end of each ramus of the mandible, each composed of an osseous and a dental portion, the osseous portion the broadest, and nearest to the extremity of the jaw. In young specimens the dental portion of these pseudo-incisors is more developed, and the osseous portion less than in adults. Tongue deeply cleft at the end.

The largest specimen obtained measures 21 inches, of which the tail from the anus measures 8·5, head 2, fore limb to end of claws 4·75, third toe and claw measured from the division between the third and fourth toes 1·12, hind limb 6·25, third toe 1·22.

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* *Stellio* is partially herbivorous, but it also lives on insects.

† By Mr. Theobald *Phrynocephalus* was also included; but the three Persian species of this genus which I have examined agree with *Agama* and *Stellio* in their dentition, and in the intestine being comparatively short. They are also purely insectivorous, and do not live in holes.

‡ For figures and descriptions of the dentition of *Uromastix hardwickii* and *U. spinipes*, see Günther on the Anatomy of *Hatteria*—Phil. Trans. pt. ii. 1867, p. 8, pl. i. figs. 12–15.

Scales. Head covered above with convex scales, largest on the snout and occiput, and on the forehead between the eyes. Canthus rostralis rounded; nostrils lateral, oval, rather large, each in the middle of a single plate below the *canthus*. Rostral enlarged; mental smaller than the rostral; laterals scarcely larger than the neighbouring scales; posterior upper labials triangular, all the rest square. Chin, except near the lower labials, covered with very small convex scales; scales of the neck equally small, subconical or mucronate, those of the lower surface in transverse rows. Sides of the neck with irregular longitudinal folds, bearing enlarged tubercular pointed scales; there are also folds below the neck, but they are not ornamented with tubercles. Scales of the back and sides all small, submucronate, with the points compressed and directed backwards, in well-marked transverse rows except near the middle line of the back; no enlarged scales on the sides. Abdominal scales rhomboidal, a little longer than those of the back, arranged in transverse series. Scales of anterior portion of the fore limb like those of the abdomen, those on the posterior surface the size of the back scales; a few slightly enlarged scales on the outer surface of the forearm. In the hind limb, the scales are larger on the inner, smaller on the outer surface; a row of large conical tubercles passes down the front of the tarsus, and large spinose tubercles are scattered over its outer surface—a few, smaller in size, occurring on the posterior portion of the thigh. Feet and toes covered beneath with keeled scales, the keels longitudinal on the soles of the fore feet, transverse on those of the hind feet. In the largest specimen, a male, there are eighteen femoral pores on one side, twenty on the other; but they are somewhat irregular; in a younger specimen there are fourteen beneath each thigh, the two series coming close together in the præanal region. Tail, when perfect, consisting of about twenty-three or twenty-four rings, the upper and lateral portion of each ring consisting of large spines, the points directed backwards; the lower portion, except towards the tip, is covered by rings of smaller nearly flat scales diminishing in size towards the base of the tail.

Colour. Olive-grey, with small rather indistinct darker spots on the back; lower parts and tail rather paler.

Intestinal canal elongate. In a specimen measuring altogether 17 inches in length, of which the tail is 7, the whole length of the intestinal tract from the cardiac end of the stomach to the anus is 28 inches, the large intestines measuring 8 inches*.

The largest specimen obtained measures 20·5 inches from nose to tip of tail, tail from anus 8·5, head 2, fore limb nearly 5, third toe of fore foot from the division between the third and fourth toes to the end of the claw 1·1, hind limb 6·1, third toe of hind foot 1·3.

This species was found inhabiting the neighbourhood of Basrah

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* In a specimen of *Centrotrachelus asmussi*, Strauch, 18 inches long, the intestinal tract measures 40 inches. In *Agama*, *Stellio*, and *Phrynocephalus* I find the intestinal tract always shorter than the body and tail: thus it is 7 inches long in an individual of *Agama agilis* measuring 10 inches.

Bussora of the maps, the port of Mesopotamia on the Shat el Arab, the estuary formed by the united Tigris and Euphrates. All the country away from the bank of the river is more or less desert; and Uromastix microlepis probably dwells in the waste dry region.

U. microlepis is closely allied to the African *U. spinipes* and *U. acanthinurus*. It is distinguished from the former by the absence of enlarged scales on the sides, and by the lateral folds on the neck bearing tubercles, and from the latter by its much smaller scales.

CENTROTRACHELUS* LORICATUS, sp. nov.

C. robustissimus, *fusco marmoratus, tuberculis majoribus dorsalibus in lineas transversas interruptas dispositis, affinis* C. asmussi, *a quo* [illegible], *nec olivaceo, dorso maculato, squamarum majorum dorsalium seriebus magis distantibus interruptisque, unguibus fortioribus, squamis supradigitalibus minoribus, et seriebus squamarum infra pedes posteriores in lineas transversas haud obliquas dispositis, tantum differt. Statura adulti* [illegible] *esse dicitur.*

Hab. haud procul a Bushire, urbe ad litus sinus Persici.

Description.—General form very massive; head short, triangular; body very broad, depressed; tail much shorter than the body, armed above and on the sides with large spinose tubercles arranged in rings, about twenty-four in number, the rings extending round the tail, but composed below of smaller keeled scales, diminishing in size towards the base of the tail. Limbs strong, the fore leg reaching the end of the snout when laid forward, and extending about halfway to the thigh when laid back; the hind legs along the side do not nearly reach the axil. Teeth about nineteen on each side of the upper jaw, and eighteen on each side of the lower, besides a cutting tooth-like process on each side in front of the latter, and a similar, but broader, single cutting edge in front of the upper jaw. These have not the lateral portions tooth-like, as in *Uromastix spinipes*, *U. hardwicki*, &c., but, as in *Centrotrachelus asmussi*, appear to be entirely formed of a process of the bone. Tongue cleft at the end. Total length of the specimen (immature) 16 inches, tail from anus 7, head 1·6, fore limb 3·25, third toe of fore limb with claw, measured from the division between the third and fourth toes, 0·6, hind limb 4·5, third toe 0·7. The femoral pores are too ill developed for their number to be determined; they appear to be closer together and more numerous than in *C. asmussi*.

Scales of the head above angulately convex, largest above the muzzle, smallest on the superciliary regions. Scales of chin and throat small. A few scattered conical tubercles on the sides of the neck. Scales of the back rather irregularly rhomboidal, subimbricate; the majority small, but crossed by transverse rows of tubercular, submucronate, enlarged scales. These rows are irregular and often interrupted, being far less distinct and regular than in the allied species *C. asmussi*. Abdomen covered with rhomboidal scales, equal in size to the smaller scales of the back, subimbricate, and in regular transverse rows. Anterior part of the fore leg clothed with diamond-shaped scales, becoming more imbricate, smaller, and much broader in proportion to their length on the foot and toes; on the latter, with the exception of the one or two large shields at the base of each claw, the scales are very much smaller than in *C. asmussi*. Scales below the hind leg much like those of the abdomen; on the outside they are small, with scattered spinose tubercles; toes much as in the fore foot, but the fourth toe has a well-marked fringe of pointed scales along the outer edge. Scales beneath the feet keeled, the keels on the fore foot longitudinal, on the hind foot transverse.

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* A figure of *C. asmussi*, Strauch, will be given in my forthcoming account of the zoology of Persia. The species was described by Strauch in 1863 (Bull. Imp. Acad. Sci. St.-Pét. vi. p. 479), from a specimen obtained by Count Keyserling north-west of Sistán.

Colour in spirits isabelline, almost cream-colour, with dusky spots on the back caused by some of the enlarged scales being much darker than the remainder of the surface.

9. On two Species of *Herpestes*, and a Hare collected by Dr. F. Day in Sind. By W. T. Blanford, F.R.S., F.Z.S.

[Received November 17, 1874.]

(Plate LXXXI.)

The fauna of Sind is still far from thoroughly known. The country is a desert, traversed by a fertile belt watered by the river Indus; and, with the exception of this belt, both the surface and fauna agree with those of Balúchistán and Southern Persia, and differ widely from those of the more fertile parts of India. In the better-watered tracts some peculiar species are found, which have not hitherto been observed elsewhere; but the number of such forms is very small.

The birds of Sind have been described by Mr. Hume ('Stray Feathers,' vol. i.), and some of the reptiles by the late Dr. Stoliczka, 'Proc. A. S. B., 1872, p. 85. The species noted in the paper last-mentioned, and several of those included in Mr. Hume's list, were collected by Dr. Day. The same naturalist has placed in my hands for description skins of a Hare and of two Ichneumons obtained by him near Sakhar, all of which he considers new to the fauna of India. After examining the skins in question, I agree in this view, one of the Ichneumons being, in my opinion, identical with a form already described from Mesopotamia, whilst the other two mammals I look upon as undescribed.

Herpestes ferrugineus, sp. nov. (Plate LXXXI.)

H. *affinis* H. griseo, *sed colore ferrugineo albo nec griseo mixto facile distinguendus. Pili ex annulis rufis cum albis alternantibus compositi, ad basin sordide rufescentes, subtus pallidiores, apicem caudæ versus longiusculi, omnino ferruginei.*

Hab. haud procul ab urbe Larkhana, in provincia Sind.

General colour ferruginous, minutely speckled and mixed with white. Fur moderately fine. Hairs of the back long, dull, rufescent at the base, and the remaining portion composed of short alternating rings of white and ferruginous, there being sometimes as many as six alternations in each hair, the extreme tips being ferruginous. On the lower parts the colour is a little paler, and the rings on the hairs are less distinct: upper portions of the feet rather darker red, soles of feet and lower part of tarsus bare. The hair on the tail is long; and the white rings on the hairs gradually disappear backwards, the tip being entirely red.

Dimensions (from a dried skin and, in consequence, only approximate): head and body 15 inches; tail (vertebræ not preserved) to end of hairs the same. The hairs on the hinder part of the back are fully 1½ inch long. Tarsus and hind foot to end of claws 2·8 in.

In general form this Mungoose closely resembles *H. griseus**, Geoffr., so much so that I was at first doubtful whether it was more than a rufous variety of it. But not only is the colour very distinct, but the skull shows some important differences. The orbit is incomplete behind; this is certainly the case in the young of *H. griseus*, but not to the same extent as in *H. ferrugineus*. The nasal bones are longer in *H. griseus*, their posterior termination being behind a line connecting the anterior edges of the orbits in the skull, whereas in the new species the nasals terminate posteriorly in front of the same line. The breadth across the frontal region immediately behind the postorbital processes is considerably less in *H. griseus*, and the auditory bullæ are differently shaped.

The skull, extracted from the skin of *H. ferrugineus*, measures:—

	inches.
Length from upper edge of foramen magnum to anterior termination of intermaxillary bone	2·7
Length of nasal bones along the suture between them ..	0·54
Breadth across widest part of zygomatic arches ..	1·38
Breadth of frontal region where narrowest (behind postorbital processes)......................	0·62
Length of lower jaw from the angle to the anterior alveolar margin	1·85

But a single specimen of this interesting new form has been obtained.

H. PERSICUS, Gray, P. Z. S. 1864, p. 554; Cat. Carn. &c. Mamm. Brit. Mus. 1869, p. 151.

Brownish grey above, very minutely intermixed with greyish white; brownish white, almost isabelline, below. Fur rather soft; hairs rather short, being rather more than half an inch long in the middle of the back, blackish at the extreme base, then very light brown for some distance, followed by a dark brown, and this again by a pale whitish ring, the extreme tip of each hair being dark brown. All the hairs of the tail are particoloured and ringed; there is no tip of any uniform colour.

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* It appears highly probable that this is *Viverra ichneumon*, var. β, of Linnæus, Syst. Nat. i. p. 63; *Viverra mungo*, Gmel. Syst. Nat. i. p. 84.

Length from nose to end of tail in two specimens about 20 inches, tail to end of hairs 10; tarsus and hind foot to end of claws 1·75. The tarsus is not naked below.

In the skull the bony orbit is complete behind, as already mentioned by Gray.

I have compared both skins and skull of this Mungoose with the types in the British Museum, and they agree admirably. The types in question were brought by Mr. Loftus from Mahamrah, in Khúzistán, the Persian province bordering on the estuary of the united Tigris and Euphrates rivers.

Two specimens of *H. persicus* were killed by Dr. Day on the right bank of the Indus, about a mile above Sakhar, in a grove of palmtrees.

Lepus dayanus, sp. nov.

L. *affinis* L. ruficaudato, *sed pelle mollissima facile distinguendus. Cauda insuper fusca, haud nigra. Dorsum ex fusco griseum cum nigro mixtum, pilis ad basin albidis, inde nigris, apices versus isabellinis, apicibus ipsis nigris. Aures longiusculæ, latæ, postice subnudæ, antice et præsertim ad marginem anteriorem magis pilosæ, ad apices fusco-nigræ, postice isabellino limbatæ, limbo apicem versus latiore. Mystaces nigræ et albæ.*

Hab. in provinciâ Indicâ Sind dictâ, haud procul ab urbe Sakhar, ad ripas Indi fluminis.

Colour on the back light brown, much mixed with black, hairs at the base nearly white, then black, towards the ends pale brown, the tips being black, on the sides of the body the black gradually disappears; belly, as usual, white; inner surface of the thighs, sides, and lower part of tail the same; upper part of tail brown, the hairs being dusky and almost black at the base, with brown tips; sides and lower part of neck as far back as the fore legs and the limbs pale rufous; soles of feet a little darker; back of neck behind the ears the same. The ears are broad and rather long, apparently slightly exceeding those of *L. ruficaudatus*, both in length and breadth; they are nearly naked on the greater part of their surface, both inside and out. The anterior portion of the outer surface is covered with short brown hairs mixed with black, the margin itself having a fringe of longer hairs; and the extreme hinder margin is covered with very short whitish hairs. The tips, too, are covered outside with dark brown hair, nearly black inside, near the edge only with yellowish buff. The hair on the posterior portion of the outer surface near the base of the ears is whitish.

This Hare is distinguished from *L. ruficaudatus* by being rather smaller, by the hair being longer and very much finer, with, so far as can be judged by the specimen examined, much longer black tips to the hairs on the back. The tail in *L. ruficaudatus* is rufous brown above, the hairs being the same colour at their base, whereas in the present species it is dusky brown above, and the hairs are blackish at the base. The skulls of the two species exhibit the following differences:—In *L. ruficaudatus* the nasal bones are longer and much more convex anteriorly, and the posterior prolongation of the postorbital process is not in contact with the skull behind, whereas in *L. dayanus* this prolongation joins the skull so as to leave a foramen behind the postorbital process, as in *L. mediterraneus*, which has on this ground alone been considered generically distinct from other Hares by Dr. Gray (Ann. & Mag. Nat. Hist. 1867, ser. 3. xx. p. 222). In the skull of *L. dayanus* which I have examined, the postorbital process is not anchylosed with the frontals behind the foramen; but it may very probably be so in older animals.

All the teeth are smaller than in *L. ruficaudatus*; and the upper incisors appear very indistinctly grooved in the new species, and, so far as I can judge, never have the raised ridge along the front part of their inner edge, so conspicuous in old skulls of *L. ruficaudatus*.

The measurements of a dried skin can only be approximative.

The whole length from the nose to the rump appears to be about 18 inches. The ears are about 4½ inches long from the orifice to to tip, and nearly 2½ broad; in fresh specimens they would be 5 inches long at least. The tarsus and hind foot to the end of the claws measure just 4 inches: this measurement, of course, would be the same in the living animal; and I find it constant in three specimens. The skull extracted is imperfect behind; the breadth across the hinder and broadest part of the zygomatic arches is 1·55 in. across the frontal bones where narrowest, between the foramina behind the postorbital processes 0·47; length of suture between the nasal bones 1·1.

This species is apparently the common Hare of Sind. Dr. Day has brought several skins from near Sakhar.

December 1, 1874.

Dr. A. Günther, F.R.S., V.P., in the Chair.

The Secretary made the following report on the additions to the Society's Menagerie during November 1874:—

The total number of registered additions to the Society's Menagerie during the month of November was 79; of which 4 were by birth, 38 by presentation, 18 by purchase, 1 received in exchange, and 18 received on deposit. The total number of departures during the same period, by death and removals, was 104.

The most noticeable additions during the month were:—

1. An example of Humboldt's Saki (*Pithecia monachus*), purchased November 2nd. Of this rare American Monkey we have previously received only one living specimen, which was figured and described by Prof. Flower, P. Z. S. 1862, p. 326.

2. A fine male of the larger form of the Patas Monkey (*Cercopithecus ruber*?), presented by Dr. R. F. Mayne, on the 3rd November. Dr. Mayne, in reply to inquiries, tells me that this monkey was purchased at Lagos, West Africa, where he informs me this species is

known as the King Monkey, but is rare. This form of the Patas, of which we have now two living specimens, nearly resembles the Nisnas Monkey (*C. pyrrhonotus*) except in having a black nose. It seems to me quite distinct from the smaller form, which we generally receive as the Patas, and requires further examination.

3. Three Night-Parrots (*Stringops habroptilus*), purchased November 3rd. Two of these appear to be a pair, agree well together, and appear likely to do well; the third, I regret to say, we have already lost.

4. A male Muntjac (*Cervulus*), purchased November 6th of the Jardin d'Acclimatation, Paris. This animal is from the French colony of Saigon, and appears to show that the form inhabiting this district is nearly allied to the true *C. muntjac*. I propose to speak of it more fully in some notes which I have now in preparation upon the *Cervuli* living in the Society's Gardens.

5. Eighteen Lancelets (*Amphioxus lanceolatus*), presented Nov. 14th by the Directors of the Zoological Station, Naples, being the first examples of this "invertebrate vertebrate" that have yet reached the Society's Fish-house.

6. A pair of Muntjacs (*Cervulus*, sp. inc.), from Formosa, presented by Mr. W. P. Galton, November 17th. Of these I shall speak more fully in the paper mentioned above which I have in preparation.

7. Two Agoutis from St. Lucia, West Indies, presented by Mr. Neville Holland, November 24th.

In August 1868 we received from Mr. G. H. Hawtayne, of St. Vincent, West Indies, a pair of Agoutis which are referred, in the 'Revised List of Vertebrates' (p. 76), to the Acouchy (*Dasyprocta acouchy*). The present animals from St. Lucia are evidently of the same species, as I find by comparing them with one of the St.-Vincent specimens, which has been preserved for examination. But they are certainly not referable to *D. acouchy*, to which I must have referred the first specimen, simply because Mr. Waterhouse says that that is the species found in the West-India Islands[*]. They belong, on the contrary, to the short and naked-tailed group of *Dasyprocta* allied to *D. aguti*, and seem most like *D. punctata* of Central America[†], but are smaller in size and much darker in colour. The fur is generally black minutely grizzled with yellow; but the crest at the back of the head and long hair on the hinder part of the back are of a nearly uniform black.

The total length of the body in the specimen from St. Vincent is about 14 inches.

Dr. Gray has described a *Dasyprocta albida* from St. Vincent, concerning which it is sufficient to refer to Mr. Waterhouse's observations (Mamm. ii. p. 397). Even if this name could be shown to have been based on an albino variety of the present animal, it would be altogether inappropriate to the normal form. I therefore propose for the present to call the West-Indian species *Dasyprocta antillensis* (Plate LXXXII.), and hope to be able to give a more complete account of it on a future occasion.

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[*] Nat. Hist. Mamm. ii. p. 392.

[†] Gray, Ann. N. H. x. p. 264 (1862), et Zool. Sulphur, pl. 15. Mr. Waterhouse unites this to the Brazilian *D. azaræ*; but I am not sure that this is correct. We have hitherto referred the examples of this form received from Central America to *D. cristata*; but this is certainly erroneous.

8. An Orange-bellied Helictis (*Helictis subaurantiaca*, Swinh.), purchased of a dealer, November 26th. This little-known carnivore was described and figured by Mr. Swinhoe in our 'Proceedings' in 1862 (P. Z. S. 1862, p. 355, pl. xliv.), from Formosan specimens. I have never before seen a living specimen of the form, which is obviously nearly allied to *Arctonyx*, and also somewhat resembles in external appearance *Taxidea americana*, of both of which we have living examples now in the Gardens.

It seems to me questionable whether *H. subaurantiaca* is really specifically distinct from *H. moschata*, Gray*; but if there *are* two Chinese species, ours belongs to the former. I may remark that I believe *Helictis personata* of Pegu†, which is united to *Helictis moschata* by Dr. Gray (Cat. Carn. Mamm. p. 142), to be a very distinct species.

The following extract was read from a letter addressed to the Secretary by the Rev. S. J. Whitmee, C.M.Z.S., dated Samoa, South Pacific, July 24th, 1874 :—

"I am forwarding to Sydney, to the care of Dr. Bennett, a couple of Doves, *Ptilonopus fasciatus* and *Phlegœnas stairi* (?), and a pair of Fruit-bats of the species described by Mr. E. R. Alston, at the meeting of the Society on January 20th last, as *Pteropus whitmeei*.

"These Dr. Bennett will forward to England for the Society should they survive the voyage. As the Bat appears to belong to a new species, you will doubtless be glad to have a pair in the Gardens.

"This *Pteropus* is very common in Samoa. The usual native name for it is *Pea'* (=*Peha*). But as *Pea'* is the name of some chiefs, this is often changed, according to the well-known Polynesian custom, into *Manu lagi* (=*Manu langi*), which means the animal of the heavens. This name is given to it on account of its mode of flight over the tops of the trees at a considerable height. It is chiefly nocturnal in its habits, but may very frequently be seen even at midday in the bush gracefully sailing high in the heavens with a very slow and regular flap of the wings.

"I once saw a number together which I estimated at over a thousand. I was visiting an extinct crater in the island of Savaii, the sides of which are perpendicular. The bottom of the crater is full of large trees, the tops of which are about 200 feet below its upper edge. These trees seem to be a favourite resort of the Bats; and at the time of my visit, 5 o'clock P.M., they had come out to disport themselves in the cool of the evening.

"The *Pteropus* is somewhat of a pest at the time of the bread-fruit scending in front, base convex, transversely striated; peristome simple, thin, roundly lunate; aperture oblique, columellar margin dilated, partly covering the umbilicus with a white callus.

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* See Mr. Swinhoe's remarks, P. Z. S. 1870, p. 623.

† *Melogale personata*, Geoffr. St.-Hilaire, Bélanger's Voy. Mamm. pl. 4.

Diam. maj. 1¾, min. 1⅓, alt. 1¼ lin.

Hab. Fitzroy Island, north-east coast of Australia; under leaves on damp ground. Found also at No. 8 Island, Claremont Group, off Cape Sidmouth, North-east Australia, amongst the drift coral above high-water mark (*coll. Brazier*).

Named after Mr. Russell, Government Astronomer, of Sydney, New South Wales.

*3. Pupa (Vertigo) macdonnelli. (Plate LXXXIII. figs. 22 & 23.)

Shell small, dextral, umbilicately fissured, oblong, thin, shining, smooth, white; whorls 5, rounded, the last small, suture impressed, narrow; apex obtuse; aperture somewhat squarely ovate, longer than broad, denticulated with 5 teeth, 4 prominent, the upper one large, placed in the centre of the aperture, and extending upwards in a thick rounded callus, the second placed to the left, minute and rounded, the third on the columella, thick and pointed, the fourth facing the upper, moderately pointed, the fifth about equal in size to the fourth; the aperture divided into four parts, peristome thickened and expanded, smooth and white, margins joined by a thick callus continuous with the peristome and extending over the body-whorl.

Length 1, breadth ½ lin.

Hab. Fitzroy Island, North-east Australia; also No. 8 Island, Claremont Group (*coll. Brazier*).

I have named this shell after Mr. W. J. MacDonnell, Astronomer, of Sydney.

4. Pupa (Vertigo) scotti. (Plate LXXXIII. figs. 24–26.)

Shell dextral, fissured, cylindrical, thin, transparent, pale brown; whorls 5½, roundly convex, last small, obliquely and transversely faintly striated; apex roundly obtuse; aperture small, ovate, denticulated within with 4 prominent white teeth, one placed on the body-whorl, elongated and rounded, a second on the columella large and acute, two placed inside the outer lip, the lower one long and prominent, the upper moderate and rounded; peristome whitish, thickened and expanded; margins continuous, with a thin coating of callus over the perforation.

Length ¾, breadth ⅓ lin.

Hab. Fitzroy Island, north-east coast of Australia; only one specimen obtained, at the watering-place, under a bit of wood (*coll. Brazier*).

I have named this after the Rev. W. Scott, Astronomer, Sydney.

*5. Cyclophorus (Ditropis) whitei. (Plate LXXXIII. figs. 5–7.)

Shell suborbicular, somewhat depressed, rather thin, obliquely rugosely striated; spire scarcely elevated, apex obtuse, smooth;

whorls 4½, increasing rapidly, last large, flattened, spirally keeled, with one above and one below the periphery, the space between them having a hollow appearance; umbilicus large, with a keel surrounding it; aperture oblique, circular; peristome simple, thin, acute. Operculum horny yellow, thin, concave, multispiral.

Diam. maj. 1, min. ¾, alt. ¾ lin.

Hab. Fitzroy Island, north-east coast of Australia; found under wood, near a freshwater stream (*coll. Brazier*).

This interesting species belongs to the new subgenus *Ditropis* of Blanford; it reminds one of a miniature *Tropidophora cuvieriana* or *T. tricarinata*, with its prominent keels.

I have named it after Mr. White, F.R.A.S., Astronomer, of Melbourne, Victoria.

*6. DIPLOMMATINA GOWLLANDI. (Plate LXXXIII. figs. 19–21.)

Shell dextral, rimate, acuminately oblong, white, hyaline, finely and obliquely ribbed, interstices smooth; spire conical, apex acute, sometimes decollated; whorls from 6 to 7, sometimes 9, the first three forming the apex are regular and tapering, the fourth broad, the fifth longer and broader, the sixth very small, having a pinched or distorted appearance in front, the seventh or last extends nearly up to the suture of the sixth; aperture vertical, subcircular; peristome thin and broad; margins continuous, shining, the outer broadly expanded, the columellar margin thick, straight, slightly channelled in front, tooth within minute.

Diam. maj. 1½, min. ¾, alt. ½ lin.

Hab. Fitzroy Island, north-east coast of Australia; found at the root of a large tree, crawling upon the grass (*coll. Brazier*).

This curious species differs from any of the *Diplommatinæ* that I have met with, the first three whorls forming the apex being regular and tapering, the fourth a little broader, the fifth still longer and broader, the sixth having a pinched-in appearance, while the last is large, giving the shell a most distorted aspect; the greatest breadth is at the fifth whorl, the least at the sixth. The few hundreds that I collected are all of the same description. I have named it after my late lamented friend John Thomas Ewing Gowlland, Staff-Commander R.N., who was unfortunately drowned while surveying in Port Jackson, August 1874, and who was in charge of the steamer that conveyed the Eclipse Expedition to Cape Sidmouth.

*7. GEORISSA MULTILIRATA. (Plate LXXXIII. figs. 8–10.)

Shell imperforate, globosely conical, reddish brown, strongly spirally striated, interstices rather rough, shining; whorls 4, roundly convex, suture channelled; spire conical, apex papillary, base convex, very finely marked with spiral lines; aperture vertical, lunate; peristome thickened; columellar margin straight, thickened, with a white callus around the perforation, which is hollowed out. Operculum shelly, ovate, smooth, brownish, with a long pointed shelly protuberance on the underside or place of attachment to the animal.

Diam. maj. ¾, min. ½, alt. 1 lin.

Hab. Fitzroy Island, north-east coast of Australia; found crawling on roots of grass in company with *Diplommatina gowllandi* (*coll. Brazier*).

8. Columbella (Mitrella) russelli. (Plate LXXXIII. figs. 17 & 18.)

Shell cylindrically oblong, somewhat fusiform, smooth, white; whorls 6, moderately convex, encircled with dark orange spots; on the last whorl are two rows of spots, the upper row larger, the lower long and reticulated, those above the suture are arrow-shaped; aperture oblong-ovate, outer lip thickened with a callus above; columella marked with fine grooves; canal short, straight.

Length 2¼, breadth 1¼ lin.

Hab. No. 6 or Eclipse Island, Claremont Group, north-east coast of Australia. I obtained only one specimen, under a stone, during our stay of nine days (*coll. Brazier*).

9. Columbella (Anachis) digglesi. (Plate LXXXIII. figs. 11 & 12.)

Shell oblong-ovate, thin, glassy, whitish, marked with oblique reddish lines, longitudinally narrowly ribbed; whorls 5½, tabled at the suture; apex acute, light blue; aperture ear-shaped, half the length of the shell; outer lip minutely denticulated within, columella curved, finely striated, with a callus extending to the upper part; canal short.

Length 1¼, breadth ¾ lin.

Hab. Fitzroy Island, north-east coast of Australia (*coll. Brazier*).

This pretty species I obtained at a depth of 18 fathoms, upon a piece of *Retepora* dredged off a rocky bottom. I have named it after Mr. Silvester Diggles of Queensland, the author of a work on Australian ornithology, and one of the observing party of the Eclipse Expedition.

*10. Columbella (Anachis) gowllandi. (Plate LXXXIII. figs. 15 & 16.)

Shell oblong-ovate, rather solid, horny yellow, longitudinally ribbed as far as the centre of the last whorl; ribs rounded and smooth, interstices smooth, below obliquely striated; whorls 8, moderately convex, encircled with a reddish band on the centre of the whorls, with two on the last, one in the middle, and one below, grained at the suture; apex acute, very smooth; aperture ear-shaped, short, outer lip thickened, smooth; columella sinuous, coated with callus, upper part with a tooth-like callus spreading towards the outer lip; canal short, straight.

Length 2¼, breadth 1 lin.

Hab. No. 6 or Eclipse Island, Claremont Group, north-east coast of Australia, under stones (*coll. Brazier*).

Of this species I obtained three specimens at the same locality; and when visiting the Solomons Islands in 1872 in H.M.S. 'Blanche' I collected four at Makera Harbour, San Christoval. It comes near to *Columbella atrata*, Gld., and *C. lentiginosa*, Hinds, two Port-Jackson species.

*11. **Liotia gowllandi.** (Plate LXXXIII. figs. 1 & 2.)

Shell solid, depressedly orbicular, white, obliquely rugose, interstices smooth; whorls 5, the last very large, grooved spirally at the periphery, also above and below it, giving the shell the appearance of having three granulated spiral ribs; suture depressed, smooth; apex acute, smooth; base rounded, ribbed; umbilicus moderately large, encircled by a spiral rib; aperture oblique, circular, lip continuous, white, thickened.

Diam. maj. 1¼, min. 1, alt. ¾ lin.

Hab. Percy Island, No. 2, north-east coast of Australia; found under stones (*coll. Brazier*).

This charming species approaches near to *Liotia speciosa*, Angas, from Port Jackson. I obtained six specimens during a stay of two hours only at the Percy Islands.

EXPLANATION OF PLATE LXXXIII.

Figs. 1, 2. *Liotia gowllandi*, p. 672.
3, 4. *Helix* (*Conulus*) *elleryi*, p. 668.
5– 7. *Cyclophorus* (*Ditropis*) *whitei*, p. 669.
8–10. *Georissa multilirata*, p. 670.
11, 12. *Columbella* (*Anachis*) *digglesi*, p. 671.
13, 14. *Helix* (*Conulus*) *russelli*, p. 668.
15, 16. *Columbella* (*Anachis*) *gowllandi*, p. 671.
17, 18. *Columbella* (*Mitrella*) *russelli*, p. 671.
19–21. *Diplommatina gowllandi*, p. 670.
22, 23. *Pupa* (*Vertigo*) *macdonnelli*, p. 669.
24–26. *Pupa* (*Vertigo*) *scotti*, p. 669.

2. Descriptions of three new Species of Homopterous Insects.

By A. G. Butler, F.L.S., F.Z.S., &c.

[Received November 24, 1874.]

Genus Cosmoscarta, Stål.

Cosmoscarta distanti, n. sp.

Allied to *C. bivittata* and *C. feralis*, but in structure agreeing better with *C. xanthorhina*. Head and thorax black, rather dull; scutellum black, pitchy at the margins; abdomen above shining purplish black; body below black; legs piceous; tegmina black, becoming piceous towards apex, crossed by two orange bands, the inner one somewhat broad, crossing centre of clavus, and widest in the centre, the outer one only half as wide, widest and angulated in the middle externally; wings smoky brown. Length 18 millims.; exp. tegm. 49.

Hab. Penang (*Distant*). In coll. W. L. Distant.

The position of this species will be after *C. feralis*.

Genus Tettigonia, Fabricius.

Tettigonia elvina, n. sp.

Head, thorax, and scutellum above dull blue-black; abdomen purplish brown above; anal segments and sides orange; tegmina subhyaline; basal two thirds divided abruptly and longitudinally into two areas, the anterior one testaceous, terminating on costal margin in a crimson-edged triangular white spot, the posterior one chocolate-brown; an oblique brown stria from middle of costal margin to centre of limitation of the testaceous area; terminal third bright orange, its outer margin blackish, its inner margin whitish hyaline; a rounded black subapical spot, partially edged internally with white; a larger blackish spot at external angle, and a small dot on inner margin; wings pale brown; body below testaceous; face whitish. Length of body 5½ millims.; exp. tegm. 17.

Hab. St. Paulo, Amazons (*Bates*). B.M.

Genus Ledropsis, White.

Ledropsis coccinea, n. sp.

Body above, tegmina, and veins of wings scarlet; ground of wings hyaline white; below bright stramineous, with the front and sides of cephalic process, the sides of thorax, and the upperside of the tibiæ and tarsi of legs scarlet. Length 10 millims.; exp. tegm. 14.

Hab. N. Australia. From Mr. Saunders's collection. B.M.

Form of *L. naso* of Walker.

3. Further Note on the Mechanism of the "Show-off" in Bustards. By A. H. Garrod, B.A., F.Z.S., Fellow of St. John's College, Cambridge, Prosector to the Society.

[Received November 24, 1874.]

It is the uncertainty with which my material comes to hand which must be my excuse for having so soon to present a further note on the "show-off" in the Bustards.

A young male specimen of the Great Bustard (*Otis tarda*) has recently died in the Society's Gardens; and one or two observations which I was able to make on its gular arrangements have done much to clear up, in my mind, the difficulties connected with that somewhat involved subject. My previous communication on this point (P. Z. S. 1874, p. 471) contains a drawing of the œsophagus, trachea, and gular pouch of a Spanish specimen of *Otis tarda*, kindly given me by Lord Lilford. In the description appended to the woodcut it is remarked that the crop is peculiar, in that it springs from the posterior instead of the anterior wall of the œsophagus; and I may mention that it is further peculiar in not being quite median, as would have been expected.

I do not know the age of the young male bird above referred to, which I have recently examined. It seemed of nearly full size, had been in the possession of the Society between three and four months, but never showed off, and had no lateral tuft of feathers from the sides of the lower jaw.

In it the œsophagus was uniformly cylindrical, with no trace of a crop, and there was no gular pouch. On looking under the tongue, however, it was evident that the arrangement of the sublingual structures was quite peculiar. In the male of *Eupodotis australis*, as I have previously remarked[*], the *frænum linguæ* is well developed in the normal manner as a median vertical fold; and, what is more, it is situated as far forward as in most animals, not behind the level of the hyoidal apparatus. In the young and pouchless male of *Otis tarda* the condition is very different. In it the *frænum linguæ* does not exist as such, but as two slight lateral vertical folds, with a median interval between them, a quarter of an inch across; so that the pouchless sublingual region of the young male *Otis tarda* is very like the excellent drawing of that of the pouched adult male in Dr. Murie's paper on the bird (P. Z. S. 1868, p. 141), except that what is there represented as an aperture to a pouch must be considered for the time being as only a slight depression. The tongue is also free for a considerably further distance along its under surface than in *Eupodotis australis*.

In a specimen of the head of *Otis tarda* in the Museum of the College of Surgeons[†] the *frænum linguæ* is median and normal in all respects. The sex is not mentioned; but from the fact of its differing so much from that of my young male specimen, I cannot help inferring that it is that of a female. If such is the case, until more examples are obtainable, the certainty as to the correctness of my surmise is not absolute.

The two sublingual fræna, with a membrane between them, make it seem almost certain to me that in the adolescent male bird, and not in the female, there is every opportunity for the development of a pouch, and that the habit of inflating the air-passages during the sexual season distends the membrane between the frena linguæ, it being comparatively weak, and causes it to develop into a pouch from continued stretching. In favour of the here assumed existence of considerable pressure is the existence of the abnormally situated diverticulum in the specimen figured in my previous paper on the subject; for, from the absence of any trace of a crop in the young bird, it may be inferred that such an organ does not pertain to the species; therefore it must be the result of some superadded force, brought into action in the adult, the distention of the pharynx during the "show-off" being quite sufficient to account for it.

The specimens figured in my earlier communication and that described in the present may all be seen in the Museum of the College of Surgeons.

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[*] P. Z. S. 1874, p. 472.

[†] No. 772 Q.

4. Further Notes on Humming-birds collected in High Peru*. By H. Whitely, C.M.Z.S.

[Received November 13, 1874.]

LESBIA NUNA.

This bird makes its appearance in this district of Peru about the beginning of September, and stays some months. It is very rapid in flight, and has a most beautiful appearance with the long tail-feathers streaming out behind. If by chance two males meet, they fight with great fury, rising higher and higher almost vertically till lost to sight. Whilst the male is hovering over a flower, its tail is never spread out; but when wounded, it skims along the ground with the tail-feathers stretched out to the greatest extent. It is a curious sight to see one of these birds trying to pass from one spot to another a long distance off in a straight line against a strong wind, which, acting on the long tail-feathers, takes it a long way off from the place it was trying to reach. Whilst perched, the two long tail-feathers are a little separated. Very small insects seem to be the principal food of this species, as I am convinced insects are of all other species and genera of Humming-birds; and the nectar of flowers is only partaken of to assist digestion. Why has no Humming-bird been able to live in England, where the cold does not exceed that of the sierras out here at an elevation of 14,000 feet? Again, all other birds, as far as my observation goes, take grit to help in the digestion of their food; but the Humming-bird does not; therefore it must take some equivalent. It is true Humming-birds may be kept for months on sugar and water or honey and water; but after that they commence to droop and die off, evidently from the too stimulating nature of the food.

ACESTRURA MULSANTI.

This bird is found in the virgin forest on the eastern slopes of the Andes, at an elevation of between 8000 and 9000 feet.

It perches generally on the topmost branches of a dead tree of great size, so that to the observer at the foot of the tree it appears to be about the size of a bee. All of a sudden it flies off, and commences to circle round and round, the same as a humble-bee; the circles become gradually larger and larger, till all at once it darts off like a flash of lightning in the direction of the bunches of flowers growing on the large creepers, where it remains hovering for a few seconds, returning afterwards to its perch on the dead tree. Its food must principally consist of very minute insects caught in the air: and by this reason one may account for its remarkably formed tail; for if the two outer tail-feathers were long and broad it would be impossible for the bird to make circles almost on its own axis, especially during a strong wind.

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* See P. Z. S. 1873, pp. 187 & 784.

been in the possession [illegible] between three and four months,
had never [illegible] eral tuft of feathers from the
sides [illegible]

ylindrical, with no trace of a
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e of *Eupodotis australis,*
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ILIS.

n of this bird I obtained was at Tinta; but I
in this province, and also on the highroad from
How strange it seems, after so many years have
iscovery of Peru, and so many distinguished people
er the same road, that they have never made men-
a specimen of this really beautiful bird.
ery peculiar. It takes a flight from one flower in the
other, perhaps some two or three hundred yards off,
dden comes to a dead stop, throws the body up ver-
il being spread out, and the beautiful crown and beard
the sunshine. This action is frequently repeated in the
n one flowering shrub to another, evidently for the pur-
ng insects in the air.
one of the few Humming-birds where colour is seen to
antage. In most of the species it is never seen till the bird
this is especially observable in *Aglæactis castelnaudi*, where
d female are adorned with a tuft of white feathers on the breast,
s impossible to distinguish male from female in the living state.

URCIERIA INCA.

his is another most beautiful species, and its habits and flight
e distinct from all others. And now, whilst speaking about flight,
would not be out of place to record my own observations on the
ubject; for almost all naturalists are agreed that in most of the spe-
es the flight is exactly similar; but from this opinion I must beg
to differ, as when a Humming-bird flies past me I can tell in a
moment if it is new to me by the manner of its flight.
B. inca is found on the wooded zones on the eastern slopes of the
Andes at an elevation of [illegible] feet, and principally resorts to a shrub
which grows to the height of ten or twelve feet, bearing beautiful
bunches of red wax-like flowers. In one of these bunches there may
be perhaps eighty or a hundred distinct flowers; and the bird appears
to visit each in succession without missing a single flower, and, from
the length of time it necessarily takes hovering over one of the
bunches, is easily shot. But of the whole family of Humming-birds
it is perhaps the most conspicuous on the wing, with its beautiful
plumage of green, with the patch of chestnut on the breast, and the
[illegible] feathers in the tail. Its flight is very rapid *.

[illegible] Peru, April 22nd, 1874.

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* [illegible]

5. On Peruvian Birds collected by Mr. Whitely. By P. L. Sclater, M.A., Ph.D., F.R.S., and Osbert Salvin, M.A., F.R.S.—Part VIII.†

[Received December 1, 1874.]

(Plate LXXXIV.)

We have again a small but interesting collection of some thirty-two species collected by the Society's Corresponding Member, Mr. H. Whitely, in the Andes of Cuzco, to report upon.

The following is a list of the species in the present collection, and their localities. Amongst them are several (having their names marked with an asterisk) on which we have notes to offer.

1. *Turdus gigantodes*, Cab. Cchachupata.
2. *Cinclus leucocephalus*. Cchachupata.
*3. *Conirostrum ferrugineiventre*. Cchachupata.
4. *Diglossa brunneiventris*. Paucartambo.
*5. *Pœcilothraupis igniventris*. Cchachupata.
6. *Pheucticus aureiventris*. Cchachupata.
7. *Phrygilus unicolor*. Cchachupata.
8. —— *fruticeti*. Paucartambo.
9. *Catamenia analis*. Paucartambo.
10. *Agriornis pollens*. Cchachupata.
11. *Myiotheretes striaticollis*. Cchachupata.
12. —— *erythropygius*. Cchachupata.
13. *Ochthœca œnanthoides*. Cchachupata.
14. —— *leucophrys*. Paucartambo.

Spathura peruana, P. Z. S. 1873, p. 784.
Lesbia nuna, suprà, p. 675.
Cynanthus mocoa, P. Z S. 1873, p. 188.
Pterophanes temmincki, P. Z. S. 1873, p. 190.
Aglæactis caumatonota, P. Z. S. 1873, p. 190.
—— *castelnaudi*, P. Z. S. 1873, p. 190.
Oreonympha nobilis, suprà, p. 676.
Ramphomicron ruficeps.
—— *microrhynchum*, P. Z. S. 1873, p. 190.
Metallura æneicauda, P. Z. S. 1873, p. 191.
—— *smaragdinicollis*, P. Z. S. 1873, p. 191.
Adelomyia inornata.
—— *chlorospila*, P. Z. S. 1873, p. 189.
Heliothrix auritus, P. Z. S. 1873, p. 189.
Petasophora iolata, P. Z. S. 1867, p. 988, and 1873, p. 188.
—— *cyanotus*, P. Z. S. 1873, p. 784.
—— *delphinæ*, P. Z. S. 1873, p. 784.
Patagona gigas, P. Z. S. 1867, p. 988, and 1869, p. 154.
Docimastes ensifer, P. Z. S. 1873, p. 189.
Helianthea osculans, P. Z. S. 1873, p. 191.
Heliangelus amethysticollis.
Bourcieria inca, suprà, p. 676.
Eriocnemis alinæ, P. Z. S. 1873, p. 784.

† For Part VII. see P. Z. S. 1873, p. 779.

15. *Ochthœca rufipectoralis.* Cchachupata.
*16. *Muscisaxicola rufipennis.* Cchachupata.
17. *Myiarchus,* sp. inc. Cchachupata.
18. *Heliochera rubrocristata.* Cchachupata.
19. *Cinclodes fuscus.* Paucartambo.
*20. —— *bifasciatus.* Paucartambo.
*21. *Synallaxis albicapilla.* Cchachupata.
22. *Anumbius striaticeps.* Paucartambo.
23. *Grallaria squamigera.* Cchachupata.
24. *Colaptes rupicola.* Cchachupata.
*25. *Psittacula andicola.* Paucartambo.
26. *Falco femoralis.* Paucartambo.
27. *Buteo erythronotus.* Paucartambo.
28. *Zenaida maculata.* Paucartambo.
*29. *Penelope sclateri.* Paucartambo.
30. *Tringa maculata.* Paucartambo.
*31. *Merganetta leucogenys,* Tsch. Upper Andes.
*32. *Nothoprocta taczanowskii.* Cchachupata.

3. CONIROSTRUM FERRUGINEIVENTRE, Sclater, P. Z. S. 1855, p. 74, *Aves*, pl. lxxxv.

This species was originally described by Sclater in 1855 from specimens transmitted to the Derby Museum from Bolivia. We have not since met with it, except the single example in Jelski's Peruvian collections (see above p. 511).

5. PŒCILOTHRAUPIS IGNIVENTRIS (Lafr. et D'Orb.); Sclat. P. Z. S. 1856, p. 242; Syn. Av. Tan. p. 68.

Mr. Whitely's skins are, in our opinion, certainly referable to this species, of which the specific characters are pointed out by Sclater, *l. s. c.* We suspect *P. ignicrissa* (Cab. J. f. O. 1873, p. 317) is not different; but nothing is said respecting the blue edgings of the wings. In *P. lunulata* from Columbia and *P. atricrissa*, Cab. J. f. O. 1866, p. 165, from Ecuador, there is no appearance of blue wing-edgings.

16. MUSCISAXICOLA RUFIPENNIS, Tacz. P. Z. S. 1874, p. 134.

We have compared Mr. Whitely's skins of this well-marked species with M. Taczanowski's type.

20. CINCLODES BIFASCIATUS, Scl. P. Z. S. 1858, p. 448, et 1873, p. 782.

Having now a skin of the true *C. palliatus* (Tsch.) from M. Jelski's collection before us, we find that it is by no means identical with the present bird, as supposed possible (P. Z. S. 1873, p. 783). *C. palliatus* is larger, of a pure white below, has the lores black, and is darker on the wings and tail. But Tschudi's figure, giving it a white end to the tail, is incorrect, only the two outer rectrices being slightly tipped with white.

21. SYNALLAXIS ALBICAPILLA, Cab. J. f. O. 1873, p. 319; Tacz. *anteà*, p. 527.

We have compared Mr. Whitely's skin of this species with the typical specimen.

25. PSITTACULA ANDICOLA, Finsch, P. Z. S. 1874, p. 90.

A second example of this interesting species, obtained, like the former, at Paucartambo.

On reexamination we find that Sclater's collection contains a skin of this little Parrot, received from M. Taczanowski as a duplicate of *Bolborhynchus orbignesius*. It was obtained by Jelski at Punamarca, Peru, in 1872.

29. PENELOPE SCLATERI, G. R. Gray.

Further examples of this species, already collected at Huasampilla by Mr. Whitely (P.Z.S. 1873, p. 780), and at Chilpes, Central Peru, by Jelski (*anteà*, p. 558). In our 'Nomenclator' we unfortunately allowed Mr. Gray's name to be superseded by *rufiventris* of Tschudi, believing at the moment that Tschudi's *Penelope rufiventris* was a synonym. But Salvin has recently examined a typical specimen of Tschudi's bird, and has decided that our former reference of this doubtful species* was correct. See his remarks Ibis, 1874, p. 318.

31. MERGANETTA LEUCOGENYS (Tsch.).

Specimens in Mr. Whitely's present collection rather resemble this form than *Merganetta turneri*, nobis (Ex. Orn. pl. 100); and we are not quite satisfied that the two species are really distinct. Mr. Whitely sends the following notice of the habits of this peculiar Duck.

This bird is found in almost all the rivers and small mountain-streams of the Upper Andes. It is a beautiful sight to come across a pair of them swimming about amongst the immense boulders in one of these mountain-torrents. It dives with great rapidity equally well up stream, against a strong current, as down stream. It climbs up large stones that, with the action of the water constantly passing over them, have become smooth as glass, and seems to be greatly aided in this by the stiff feathers in the tail.

I think the spikes on the wings are meant to assist the bird in diving rapidly, as I know of no enemy it has that would make them a formidable weapon to be used in attack or defence. Its food consists of grasses and sedges; and the flesh is said to be a great delicacy, though personally I have never made the trial. The males are much more plentiful than the females. I have not been able to find their breeding-ground, but should suspect it would be in some of the small caverns near the mountain-torrents.

32. NOTHOPROCTA TACZANOWSKII, sp. nov. (Plate LXXXIV.)

Supra fusca, plumis nigro late transfasciatis et pallido cervino utrinque marginatis: subtus omnino dilutior, pectore cinereo

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* P. Z. S. 1870, p. 531.

adumbrato et maculis pallide cervinis supra et subtus nigro marginatis ornato : gula et abdomine medio lacteo-albescentibus : lateribus et crisso cum subcaudalibus fere sicut pectus transfasciatis : alarum remigibus nigricantibus cervino frequenter transfasciatis, his fasciis in pogonio externo minus distinctis sed apparentibus : rostro elongato incurvo, obscure corneo : pedibus flavidis : long. tota 13, *alæ* 7, *tarsi* 1·9.

Hab. Peruvia alta (*Jelski et Whitely*).

We have based this new species of our genus *Nothoprocta** upon a specimen collected by Jelski at Maraynioc in Central Peru, which M. Taczanowski sent us for examination †, and of which we also take this opportunity of giving a figure (Plate LXXXIV.).

Mr. Whitely's two skins from Cchachupata, at first sight appear to belong to two distinct species; but comparing them with M. Jelski's specimen we find that, though the latter agrees closely with the larger of Mr. Whitely's birds in general coloration, it corresponds in dimensions with the smaller. We are disposed, therefore, to consider the smaller of Mr. Whitely's two specimens to be in immature plumage, the difference of size, chiefly that of the bill, being attributable to individual variation, all three of the birds before us being marked as males.

This younger bird, if such it really is, differs chiefly in having the breast marked with dark spots with light edges, instead of oval light spots edged on their uppersides with black. The cross bars, too, of the adult birds seen on the chest are absent, and are only slightly shown on the flanks. The general colour of the breast of the young bird is fawn rather than grey. The upper surface is precisely alike in both.

In our 'Nomenclator,' p. 153, we assigned four species to *Nothoprocta*. To these we now have to add the species described above and M. Taczanowski's *Nothoprocta branickii* (*anteà*, p. 563).

The subjoined table may assist in the determination of the species of this difficult genus :—

- Prim. ext. in pogonio interno transfasciatis .... 1. *taczanowskii.*
- Prim. ext. in pogonio interno unicoloribus.
  - Pectore cinereo, albido maculato.
    - Secundariis nigro-fuscis, rufo transfasciatis .... 2. *perdicaria.*
    - Secundariis nigro-fuscis, fasciis fulvis notatis .... 3. *pentlandi.*
  - Pectore cinereo, indistincte vermiculato.
    - Major, tectr. alar. late transfasciatis .... 4. *ornata.*
    - Minor, tectr. alar. minute fasciatis .... 5. *branickii.*
  - Pectore rufescente .... 6. *curvirostris.*

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* Nomencl. Av. Neotr. p. 156 (1873).

† See *anteà*, p. 564.

APPENDIX.

LIST OF ADDITIONS TO THE SOCIETY'S MENAGERIE

DURING THE YEAR

1874.

Jan. 1. 1 Chinese Water-Deer (*Hydropotes inermis*), ♀. Purchased. See above, p. 110.
2 Chinese Pucras Pheasants (*Pucrasia xanthospila*). Deposited.
1 Great Eagle Owl (*Bubo maximus*), ♂. Deposited. From China.
2. 2 Senegal Touracous (*Corythaix persa*). Presented by Mr. E. Hawkins.
2 Blue-rumped Parrakeets (*Psittinus malaccensis*). Purchased.
2 Alario Sparrows (*Passer alario*). Purchased.
1 Red-tailed Fox (*Canis fulvicaudus*). Purchased. From South America.
1 Moluccan Deer (*Cervus moluccensis*), ♂. Purchased.
2 Black-tailed Hawfinches (*Coccothraustes melanurus*), ♂ and ♀. Purchased.
3. 1 Common Otter (*Lutra vulgaris*). Deposited.
6. 1 Drill (*Cynocephalus leucophæus*), ♂. Purchased.
7. 1 Crested Ground-Parrakeet (*Calopsitta novæ hollandiæ*), ♂. Presented by Vice-Admiral Wallis Houston.
3 Common Marmosets (*Hapale jacchus*), ♂. Presented by Le Chevalier d'Albuquerque.
8. 1 Lion (*Felis leo*), ♀. Presented by J. Humfrey, Esq. From Kattywar, East India.
12. 2 Mongoose Lemurs (*Lemur mongoz*), ♂ and ♀. Purchased.
4 Grenadier Weaverbirds (*Euplectes oryx*). Purchased.
1 Masked Weaverbird (*Hyphantornis personata*), ♀. Purchased.
1 Crimson-winged Waxbill (*Pytelia phœnicoptera*). Purchased.
1 Malabar Green Bulbul (*Phyllornis aurifrons*). Purchased.
2 Pink-headed Ducks (*Anas caryophyllacea*), ♂ and ♀. Purchased. See above, p. 110.
1 Nicobar Pigeon (*Calœnas nicobarica*). Received in exchange.
13. 2 Common Roe-Deer (*Capreolus caprea*), ♂ and ♀. Presented 1 by J. Edersheim, Esq., and 1 by F. Hillel, Esq.
1 Common Heron (*Ardea cinerea*). Presented by Mr. H. C. Tait, C.M.Z.S. From West Africa.
14. 1 Cheetah (*Felis jubata*), ♀. Received in exchange.
1 Common Barn-Owl (*Strix flammea*). Presented by Mr. Burrell.
1 White-lipped Peccary (*Dicotyles labiatus*). Purchased.

Feb. 28. 1 Collared Peccary (*Dicotyles tajacu*). Deposited.

1 Galapagan Tortoise (*Testudo elephantopus*). Deposited.

2 Blue-tailed Lories (*Lorius tricolor*). Purchased.

Mar. 3. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Mr. T. Waight.

1 Goshawk (*Astur palumbarius*). Presented by Mr. Gerald Lascelles.

1 Ditto. Deposited.

2 Common Crowned Pigeons (*Goura coronata*). Purchased.

1 Common Cassowary (*Casuarius galeatus*). Purchased.

1 Blue-streaked Lory (*Eos reticulata*). Purchased.

1 Red Lory (*Eos rubra*). Purchased.

5. 2 Spotted Turtledoves (*Turtur suratensis*). Received in exchange.

6. 2 Love-bird Parrakeets (*Agapornis pullaria*). Purchased.

2 Verreaux's Guinea-fowls (*Numida eduardi*). Purchased.

1 White-throated Violet Pigeon (*Ianthænas leucolæma*). Purchased.

7. 1 Negro Tamarin (*Midas ursulus*), ♂. Presented by Mr. W. Thomson.

1 Javan Rhinoceros (*Rhinoceros sondaicus*), ♂. Purchased. See above, p. 182.

9. 1 Finsch's Amazon (*Chrysotis finschi*). Presented by Mrs. Chivers. See above, p. 206, Plate XXXIV.

1 Blue-and-Yellow Maccaw (*Ara ararauna*). Presented by Miss J. Staines.

1 Starred Tortoise (*Testudo stellata*). Presented by Capt. Smelley.

10. 1 Pintail Duck (*Dafila acuta*), ♂. Presented by Mr. J. Bailey, jun., F.Z.S.

12. 1 Common Otter (*Lutra vulgaris*), ♂. Presented by Dr. Stafford.

14. 1 Cornish Chough (*Fregilus graculus*). Presented by Mr. J. T. Hewes.

15. 1 Virginian Deer (*Cervus virginianus*), ♂. Presented by Mr. N. M. Bateson.

16. 2 Three-striped Squirrels (*Sciurus tristriatus*), ♀. Presented by Capt. Forster. From Ceylon.

17. 1 Sonnerat's Jungle-fowl (*Gallus sonnerati*), ♂. Presented by Mrs. White.

19. 2 Tench (*Tinca vulgaris*). Presented by Mr. W. Arnold.

3 Barbary Sheep (*Ovis tragelaphus*), 1 ♂ and 2 ♀. Born in the Menagerie.

20. 1 Black-eared Marmoset (*Hapale penicillata*). Presented by Mr. F. Graham.

2 Boatbills (*Cancroma cochlearia*). Purchased.

21. 1 Leadbeater's Cockatoo (*Cacatua leadbeateri*). Presented by Col. Carington.

23. 1 Wheatear (*Saxicola œnanthe*), ♂. Purchased.

24. 2 Laughing Kingfishers (*Dacelo gigantea*). Presented by Mr. J. F. Hayward.

2 Egyptian Geese (*Chenalopex ægyptiaca*), ♂ and ♀. Deposited.

26. 1 Common Buzzard (*Buteo vulgaris*). Presented by Mr. C. Mills.

28. 1 Eland (*Oreas canna*). Born in the Menagerie.

Feb. 2. 1 Axis Deer (*Cervus axis*), ♂. Born in the Menagerie.

1 Collared Fruit-Bat (*Cynonycteris collaris*). Born in the Menagerie.

1 Common Kingfisher (*Alcedo ispida*). Presented by Mr. A. Yates.

1 Griffon Vulture (*Gyps fulvus*). Deposited.

5. 1 Feline Dourocouli (*Nyctipithecus felinus*), ♀. Presented by Mr. Geo. Hollis.

1 Molucca Deer (*Cervus moluccensis*), ♂. Born in the Menagerie.

6. 1 Water-Rail (*Rallus aquaticus*). Purchased.

7. 1 Suricate (*Suricata zenik*), ♂. Presented by J. Lloyd, Esq.

1 West-African Python (*Python sabæ*). Presented by J. Lloyd, Esq.

2 De Filippi's Meadow-Starlings (*Sturnella defilippi*), ♂ and ♀. Received in exchange.

9. 1 Bonnet-Monkey (*Macacus radiatus*), ♀. Presented by Mr. R. Wilkinson.

10. 1 Moustache-Monkey (*Cercopithecus cephus*), ♀. Purchased.

1 Eroded Cinixys (*Cinixys erosa*). Purchased.

11. 2 Coatis (*Nasua nasica*), ♂ and ♀. Presented by Mr. W. P. Chambers.

1 Egyptian Fox (*Canis niloticus*). Presented by Mr. J. T. Keane.

5 Branched Sea-horses (*Hippocampus ramulosus*). Purchased.

14. 1 Capybara (*Hydrochœrus capybara*). Purchased.

1 Great Kangaroo (*Macropus giganteus*), ♀. Born in the Menagerie.

17. 1 Malayan Hornbill (*Buceros malayanus*). Purchased. See above, p. 151.

1 Pennant's Parrakeet (*Platycercus pennanti*). Presented by Dr. Hy. Wheeler.

1 Crested Ground-Parrakeet (*Calopsitta novæ hollandiæ*). Presented by Dr. Hy. Wheeler.

18. 1 Indian Python (*Python molurus*). Presented by Mr. C. J. Noble. From Hong Kong. See above, p. 151.

1 Common Gull (*Larus canus*). Presented by Mr. W. H. Stanley.

19. 1 Mexican Agouti (*Dasyprocta mexicana*). Presented by Mr. C. H. M. de Lichtabbel.

20. 1 Hybrid Pheasant (between *Thaumalea amherstiæ* and *T. picta*). Received in exchange.

23. 1 Common Rhea (*Rhea americana*). Presented by Mr. A. Maxwell.

1 Black-tailed Godwit (*Limosa melanura*). Presented by Mr. H. S. Marks.

24. 2 Common Pintails (*Dafila acuta*), ♂ and ♀. Purchased.

2 Common Call Ducks (*Anas boschas*), ♂ and ♀. Purchased.

27. 1 Large-eyed Deer (*Cervus euopis*), ♂. Purchased. From Newchang, North China. See above, p. 151.

2 Falcated Teal (*Querquedula falcata*), ♂. Purchased. From China. See above, p. 152.

1 Pochard Duck (*Fuligula ferina*), ♂. Purchased. From China.

1 Short-tailed Muntjac (*Cervulus micrurus*), ♀. Purchased. See P. Z. S. 1875.

3 Japanese Teal (*Querq[illegible]ula formosa*), ♂. Deposited.

Apr. 10. 2 Spotted Salamanders (*Salamandra maculosa*). Presented by the Rev. S. Wilkinson.

1 Green Lizard (*Lacerta viridis*). Presented by the Rev. S. Wilkinson.

1 Common Rook (*Corvus frugilegus*). Purchased.

13. 1 Common Fox (*Canis vulpes*). Presented by Mr. Ouchterlony. From Russia.

2 Japanese Teal (*Querquedula formosa*), ♂ and ♀. Deposited.

14. 1 Long-nosed Crocodile (*Crocodilus cataphractus*). Presented by Mr. H. T. M. Cooper.

15. 1 White-cheeked Flying Squirrel (*Pteromys leucogenys*). Presented by Mr. A. Gower, H.B.M. Consul at Kobe, Japan. See above, p. 247.

2 Golden Pheasants (*Thaumalea picta*). Presented by the Rev. A. B. Fraser.

1 Red Kangaroo (*Macropus rufus*), ♂. Born in the Menagerie.

17. 1 Mourning Kangaroo (*Halmaturus luctuosus*), ♀. Deposited. From New Guinea. See above, p. 247, Plate XLII., also P. Z. S. 1875.

1 Six-banded Armadillo (*Dasypus sexcinctus*), ♂. Purchased.

20. 1 Azara's Fox (*Canis azaræ*), ♀. Purchased.

1 White-winged Whydah-bird (*Urobrachya albonotata*). Presented by Mr. I. Fairchild.

21. 3 Long-eared Owls (*Otus vulgaris*). Presented by Mr. Hincks.

1 Rose-crested Cockatoo (*Cacatua moluccensis*). Presented by Mr. H. Baldwin.

1 Snowy Owl (*Nyctea nivea*). Purchased.

2 Grey-headed Parrakeets (*Agapornis cana*). Purchased.

1 Geoffroy's Cat (*Felis geoffroii*). Purchased.

1 Green-cheeked Amazon (*Chrysotis viridigenalis*). Purchased.

8 Bass (*Labrax lupus*). Purchased.

22. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mrs. Manser.

7 Chilian Pintails (*Dafila spinicauda*). Hatched in the Gardens.

23. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by the Countess Somers.

24. 1 Bladder-nosed Seal (*Cystophora cristata*), ♂. Presented by Capt. D. Gray. See above, p. 247.

3 Bladder-nosed Seals (*Cystophora cristata*), 2 ♂ and 1 ♀. Presented by Capt. Alex. Gray.

1 Greenland Seal (*Phoca grœnlandica*), ♂. Presented by Capt. Alex. Gray.

1 Leadbeater's Cockatoo (*Cacatua leadbeateri*). Deposited by Miss C. Boyle.

1 Smooth Snake (*Coronella lævis*). Presented by the Rev. A. C. Hervey.

25. 1 Ring-necked Parrakeet (*Palæornis torquata*), ♂. Presented by Mr. H. J. Aveling.

A Collection of Marine Fishes. Presented by Mr. W. Thompson.

27. 1 Great Kangaroo (*Macropus giganteus*), ♂. Deposited.

28. 1 Common Crowned Pigeon (*Goura coronata*). Hatched in the Gardens.

1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Miss Heath.

1 Common Buzzard (*Buteo vulgaris*). Deposited.

29. 1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Born in the Gardens.

Apr. 30. 1 Prince Alfred's Deer (*Cervus alfredi*), ♂. Born in the Gardens.
300 Young Salmon. Presented by Mr. F. Buckland, F.Z.S.
12 Marbled Newts (*Triton marmoratus*). Purchased.
2 Alpine Newts (*Triton alpestris*). Purchased.
7 Sand-Lizards (*Lacerta agilis*). Purchased.

May 2. 1 Sand-Lizard (*Lacerta agilis*). Presented by Mr. W. A. Forbes.
4. 1 Grey Ichneumon (*Herpestes griseus*). Presented by Mr. H. Humphrey.
5. 1 Bonnet-Monkey (*Macacus radiatus*), ♀. Deposited.
7 Upland Geese (*Chloëphaga magellanica*). Hatched in the Gardens.
6. 1 African Civet Cat (*Viverra civetta*). Presented by Mr. W. B. Ramsay.
1 Garnett's Galago (*Galago garnetti*), ♂. Presented by Mr. R. H. Cusack.
1 Blue-faced Green Amazon (*Chrysotis bouqueti*). Purchased. See above, p. 323, also P. Z. S. 1875, plate xi.
7. 1 Sun-Bittern (*Eurypyga helias*). Hatched in the Gardens.
8. 1 Ring-necked Parrakeet (*Palæornis torquata*). Presented by Miss Morris.
9. 2 Black Sakis (*Pithecia satanas*), ♂. Purchased.
1 Negro Tamarin (*Midas ursulus*), ♂. Purchased.
2 Squirrel Monkeys (*Saimaris sciurea*), ♂ and ♀. Purchased.
1 Dusky Parrot (*Pionus violaceus*). Purchased.
1 Capybara (*Hydrochœrus capybara*). Presented by Dr. Henry Young.
1 Coypu (*Myopotamus coypus*). Presented by Mr. C. R. Young.
1 Sharp-tailed Grouse (*Tetrao phasianellus*). Received in exchange.
4 European Terrapins (*Emys europæa*). Deposited.
10. 7 Chilian Pintails (*Dafila spinicauda*). Hatched in the Gardens.
1 Mouflon (*Ovis musimon*). Born in the Menagerie.
11. 1 Ring-necked Parrakeet (*Palæornis torquata*). Presented by Mr. A. de Normanville.
13. 1 Koodoo (*Strepsiceros kudu*), ♂. Purchased. See above, p. 323.
1 Coati (*Nasua nasica*), ♀. Presented by Miss E. Waller.
1 Common Paradoxure (*Paradoxurus typus*), ♂. Presented by Mr. G. R. Colbeck.
2 Muscovy Ducks (*Cairina moschata*), ♀. Presented by Mr. S. Oliff.
14. 8 Chilian Pintails (*Dafila spinicauda*). Hatched in the Gardens.
1 Crested Curassow (*Crax alector*). Presented by Mr. George Bruce.
15. 1 Domestic Sheep (*Ovis aries*), ♂. Presented by Capt. E. R. Freemantle, R.N., C.B. From West Africa.
2 Common Kestrels (*Tinnunculus alaudarius*). Presented by Mr. G. W. Thompson. Captured at sea.
3 Horned Lizards (*Phrynosoma cornutum*). Purchased.
17. 1 Upland Goose (*Chloëphaga magellanica*). Hatched in the Gardens.
18. 2 Hairy Armadilloes (*Dasypus villosus*). Born in the Menagerie.
19. 3 Temminck's Tragopans (*Ceriornis temmincki*). Hatched in the Gardens.

May 19. 3 Peacock Pheasants (*Polyplectron chinquis*). Hatched in the Gardens.

2 Ceylonese Jungle-fowl (*Gallus stanleyi*). Hatched in the Gardens.

20. 1 Common Quail (*Coturnix communis*). Presented by Mr. J. J. Croker.

1 Rhesus Monkey (*Macacus erythræus*). Deposited.

21. 1 Raccoon-like Dog (*Nyctereutes procyonides*). Purchased. From Amoorland. See above, p. 323, Plate L.

1 Great Bustard (*Otis tarda*). Purchased.

5 Red-footed Falcons (*Erythropus vespertinus*). Purchased.

4 Ruddy Sheldrakes (*Tadorna rutila*). Hatched in the Gardens.

22. 1 Orang Outang (*Simia satyrus*), ♂. Deposited.

1 Brown Capuchin (*Cebus fatuellus*), ♀. Deposited.

1 Crocodile (*Crocodilus vulgaris*). Presented by the Hon. P. C. F. Berkeley.

1 Wild Boar (*Sus scrofa*), ♂. Presented by W. J. Tempest, Esq. From Algeria.

23. 1 Cape Buffalo (*Bubalus caffer*), ♂. Born in the Menagerie.

3 Crimson-winged Waxbills (*Pytelia phœnicoptera*). Purchased.

25. 1 Vervet Monkey (*Cercopithecus lalandi*), ♂. Presented by Lord Calthorpe.

1 Pine-Marten (*Martes abietum*). Presented by Mr. J. W. Francis.

26. 1 Muscat Gazelle (*Gazella muscatensis*), ♂. Presented by Mr. J. H. Bainbridge.

1 Maugé's Dasyure (*Dasyurus maugei*), ♀. Presented by Mr. F. Kirby.

2 Bronze-winged Pigeons (*Phaps chalcoptera*). Hatched in the Gardens.

27. 1 Bonnet-Monkey (*Macacus radiatus*), ♀. Deposited.

2 Pacific Curlews (*Numenius femoralis*). Presented by the Rev. S. J. Whitmee, C.M.Z.S. From Quiros Island, South Pacific.

1 Painted-necked Cassowary (*Casuarius picticollis*). Purchased. From South of New Guinea. See P. Z. S. 1875, plate xviii.

5 Variegated Sheldrakes (*Tadorna variegata*). Hatched in the Gardens.

28. 1 Beisa Antelope (*Oryx beisa*), ♂. Presented by Admiral Arthur Cumming. From Eastern Africa. See above, p. 323.

1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mr. Bruce.

1 Common Gull (*Larus canus*). Presented by Mr. M. F. W. Martin.

8 Chiloe Widgeon (*Mareca chiloensis*). Hatched in the Gardens.

29. 2 Sclater's Muntjacs (*Cervulus sclateri*), ♂. Purchased. From China. See P. Z. S. 1875.

1 Short-tailed Muntjac (*Cervulus micrurus*), ♂. Purchased. From China.

1 Guilding's Amazon (*Chrysotis guildingi*). Purchased. From St. Vincent, West Indies. See above, p. 324.

1 Indian Ratel (*Mellivora indica*), ♀. Presented by Mr. L. McNeil.

1 Ring-necked Parrakeet (*Palæornis torquata*). Presented by Mrs. Catlin.

6 Falcated Teal (*Querquedula falcata*), 3 ♂, 3 ♀. Purchased.

1 Black-winged Peacock (*Pavo nigripennis*). Presented by the Hon. A. S. Canning.

May 30. 1 Sonnerat's Jungle-fowl (*Gallus sonnerati*), ♀. Presented by Mr. A. Yates.

7 Trumpeter Swans (*Cygnus buccinator*). Hatched in the Gardens.

June 1. 1 Great Ant-eater (*Myrmecophaga jubata*). Presented by Mr. Teofilo Mendez. From the Province of Salta, Argentine Republic. See above, p. 494.

1 Vervet Monkey (*Cercopithecus lalandii*), ♂. Presented by Commander J. H. Smith.

1 Stanley Crane (*Tetrapteryx paradisea*). Purchased.

1 Spotted-billed Duck (*Anas pœcilorhyncha*). Hatched in the Gardens.

2. 1 Common Fox (*Canis vulpes*), ♀. Presented by Mr. J. Sheppard.

2 Great Kangaroos (*Macropus giganteus*), ♂ and ♀. Born in the Menagerie.

1 Hybrid Kangaroo (between *Hypsiprymnus gaimardi* and *H. ogilbyi*), ♂. Born in the Menagerie.

9 Summer Ducks (*Aix sponsa*). Hatched in the Gardens.

3. 1 Nicobar Pigeon (*Calœnas nicobarica*). Purchased.

4 Spotted-billed Ducks (*Anas pœcilorhyncha*). Deposited.

1 Red-crested Whistling Duck (*Fuligula rufina*), ♂. Presented by E. Buck, Esq. From India.

4. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Capt. J. Mahood.

1 Common Rook (*Corvus frugilegus*). Purchased.

1 Temminck's Snapper (*Macroclemmys temmincki*). Presented by the Smithsonian Institution, Washington, U.S.A. From New Orleans.

1 Floridan Terrapin (*Clemmys floridana*). Presented by the Smithsonian Institution, Washington, U.S.A. From St. John's River.

1 American Box-Tortoise (*Terrapene carinata*). Presented by the Smithsonian Institution, Washington, U.S.A.

1 North-American Trionyx (*Trionyx ferox*). Presented by the Smithsonian Institution, Washington, U.S.A. From Lake Michigan. See above, p. 494.

6 Florida Land-Tortoises (*Testudo polyphemus*). Presented by the Smithsonian Institution, Washington, U.S.A.

5. 1 Pig-tailed Monkey (*Macacus nemestrinus*), ♀. Presented by Mr. J. E. Kincaid.

1 Red Deer (*Cervus elaphus*), ♀. Presented by the Lord Herbrand Russell, F.Z.S.

24 Axolotls (*Siredon mexicanus*). Purchased.

2 Temminck's Tragopans (*Ceriornis temmincki*). Hatched in the Gardens.

1 Ceylonese Jungle-fowl (*Gallus stanleyi*). Hatched in the Gardens.

2 ¾-bred Amherst Pheasants (between *Thaumalea amherstiæ* ♂, and hybrid of same species ♀). Hatched in the Gardens.

6. 5 Australian Wild Ducks (*Anas superciliosa*). Hatched in the Gardens.

1 Rufescent Snake (*Leptodira rufescens*). Presented by the Rev. G. H. R. Fisk.

1 Horned Viper (*Vipera cornuta*). Presented by the Rev. G. H. R. Fisk.

7. 1 Griffon Vulture (*Gyps fulvus*). Presented by Mr. Saville Reid. From Spain.

June 7. 3 Barbary Partridges (*Perdix petrosa*). Presented by Mr. Saville Reid. From Spain.
8. 1 Tuberculated Lizard (*Iguana tuberculata*). Presented by Mr. W. Jamrach.
1 Stump-tailed Lizard (*Trachydosaurus rugosus*). Presented by Mr. Nelson Clements.
9. 1 Spotted Cavy (*Cœlogenys paca*). Presented by Mr. Jas. W. Alexander.
2 Common Cormorants (*Phalacrocorax carbo*). Deposited.
10. 1 Barbary Wild Sheep (*Ovis tragelaphus*), ♂. Born in the Menagerie.
2 Peacock Pheasants (*Polyplectron chinquis*). Hatched in the Gardens.
11. 1 Black-backed Jackal (*Canis mesomelas*), ♂. Presented by Mr. J. Rackstraw.
1 Persian Gazelle (*Gazella subgutturosa*), ♂. Presented by Mr. Edwyn S. Dawes.
1 Syrian Fennec Fox (*Canis famelicus*), ♀. Presented by Mr. Edwyn S. Dawes. From near Bushire, Persia.
4 Serrated Terrapins (*Clemmys serrata*). Presented by the Smithsonian Institution, Washington, U.S.A. From North Carolina. See above, p. 494.
1 Red-vented Terrapin (*Clemmys rubriventris*). Presented by the Smithsonian Institution, Washington, U.S.A. From the Potomac River.
12. 2 Trout (*Salmo fario*). Presented by Messrs. J. and H. Jonas.
4 Tench, Golden variety (*Tinca vulgaris*). Presented by Messrs. J. and H. Jonas.
13. 1 Bonnet-Monkey (*Macacus radiatus*), ♀. Presented by Miss Du Bose.
1 Crested Agouti (*Dasyprocta cristata*). Presented by Mrs. Wood.
5 Mandarin Ducks (*Aix galericulata*). Hatched in the Gardens.
14. 1 Vulturine Guinea-fowl (*Numida vulturina*). Presented by Dr. John Kirk, C.M.Z.S.
15. 1 Common Raccoon (*Procyon lotor*), ♂. Presented by Mr. S. Taylor.
3 Crested Ground-Parrakeets (*Calopsitta novæ-hollandiæ*). Hatched in the Gardens.
2 White-winged Zenaida Doves (*Zenaida leucoptera*), ♂ and ♀. Received in exchange.
16. 1 Sumatran Civet (*Viverra tangalunga*), ♂. Presented by Mr. Jamrach.
1 Blood-rumped Parrakeet (*Psephotus hæmatonotus*). Purchased.
1 Honey-Buzzard (*Pernis apivorus*), ♂. Purchased.
18. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mr. Wood.
2 Huanacos (*Lama huanacos*), ♂ and ♀. Presented by Mr. W. G. Parry. From Patagonia.
1 Patagonian Cavy (*Dolichotis patachonica*). Presented by Mr. W. G. Parry.
19. 47 Whiting Pout (*Gadus luscus*). Purchased.
20. 1 Wapiti Deer (*Cervus canadensis*), ♀. Born in the Menagerie.
1 Malayan Tapir (*Tapirus indicus*), ♂. Deposited.
2 White Cranes (*Grus leucogeranus*). Purchased. See above, p. 494.
2 Blue-cheeked Barbets (*Megalæma asiatica*). Purchased.

June 20. 7 Australian Wild Ducks (*Anas superciliosa*). Hatched in the Gardens.

21. 1 Crested Pigeon (*Ocyphaps lophotes*). Hatched in the Gardens.

22. 2 Rhesus Monkeys (*Macacus erythræus*), ♂ and ♀. Presented by Mr. W. Dunn, C.M.Z.S.

1 White-cheeked Capuchin (*Cebus lunatus*), ♂. Deposited.

23. 1 Chinese Turtledove (*Turtur chinensis*), ♂. Presented by Major F. Gildea.

24. 1 Black-backed Jackal (*Canis mesomelas*). Presented by Capt. Webster.

26. 1 Red-vented Bulbul (*Pycnonotus hæmorrhous*). Deposited.

1 Canadian Beaver (*Castor canadensis*). Born in the Menagerie.

27. 1 Virginian Deer (*Cervus virginianus*), ♂. Born in the Menagerie.

1 Lanner Falcon (*Falco lanarius*). Purchased.

29. 1 Red Brocket (*Cervus rufus*), ♀. Received in exchange.

2 Musquashes (*Fiber zibethicus*), ♂ and ♀. Received in exchange.

1 Common Raven (*Corvus corax*). Deposited. From Sardinia.

1 Hooded Crow (*Corvus cornix*). Deposited. From Sardinia.

2 Mediterranean Herring-Gulls (*Larus leucophæus*). Deposited. From Sardinia.

2 Audouin's Gulls (*Larus audouini*). Presented by Lord Lilford, F.Z.S. From Sardinia. See above, p. 494.

2 Solitary Thrushes (*Monticola cyanus*). Deposited. From Italy.

4 Ocellated Land-Skinks (*Seps ocellatus*). Presented by Lord Lilford, F.Z.S.

5 Ocellated Land-Skinks (*Seps ocellatus*). Deposited.

2 Lilford's Lizards (*Lacerta lilfordi*). Presented by Lord Lilford, F.Z.S. From Minorca. See above, p. 494.

30. 1 White-fronted Capuchin (*Cebus albifrons*), ♂. Presented by Mr. T. R. Pickthorn.

1 Harpy Eagle (*Thrasaëtus harpyia*). Purchased. From Paraguay.

1 Laughing Falcon (*Herpetotheres cachinnans*). Purchased. From Brazil.

7 Ariel Toucans (*Ramphastos ariel*). Purchased.

1 Himalayan Bear (*Ursus tibetanus*). Presented by Mr. George Lockie.

2 Common Widgeon (*Mareca penelope*). Hatched in the Gardens.

July 1. 4 Viperine Snakes (*Tropidonotus viperinus*). Presented by Mr. G. H. Fenton.

2. 1 Common Cuckoo (*Cuculus canorus*). Presented by Mr. J. F. Lewis.

1 Greek Partridge (*Caccabis saxatilis*). Deposited.

3. 6 Amherst Pheasants (*Thaumalea amherstiæ*). Hatched in the Gardens.

3 Three-quarter-bred Pheasants (between *T. amherstiæ* ♂ and hybrid ♀ of same species). Hatched in the Gardens.

1 Siamese Pheasant (*Euplocamus prælatus*). Hatched in the Gardens.

3 Silver Pheasants (*Euplocamus nycthemerus*). Hatched in the Gardens.

4 White-crested Kaleeges (*Euplocamus albocristatus*). Hatched in the Gardens.

July 3. 3 Ceylonese Jungle-fowl (*Gallus stanleyi*). Hatched in the Gardens.

7 Chiloe Widgeon (*Mareca chiloensis*). Hatched in the Gardens.

4. 2 Red Kangaroos (*Macropus rufus*), ♂ and ♀. Presented by the Acclimatization Society of Melbourne, Victoria.

1 Wedge-tailed Eagle (*Aquila audax*). Purchased.

1 Earle's Weka Rail (*Ocydromus earli*). Purchased.

3 Spanish Terrapins (*Clemmys leprosa*). Presented by Major C. Stirling.

5. 1 Collared Fruit-Bat (*Cynonycteris collaris*). Born in the Menagerie.

6. 1 Rhesus Monkey (*Macacus erythræus*), ♂. Presented by Mr. J. Allen.

9 Rosy-billed Ducks (*Metopiana peposaca*). Hatched in the Gardens.

7. 1 Variegated Spider Monkey (*Ateles variegatus*), ♀. Deposited.

1 Red Brocket (*Cervus rufus*), ♀. Purchased.

1 Eyra (*Felis eyra*). Purchased.

9. 1 Chimpanzee (*Troglodytes niger*), ♀. Deposited.

1 Spectacled Bear (*Ursus ornatus*), ♀. Purchased.

10. 2 Fire-bellied Toads (*Bombinator igneus*). Presented by Mr. A. H. Cocks.

11. 1 Patas Monkey (*Cercopithecus ruber*), ♂. Purchased.

1 Banded Ichneumon (*Herpestes fasciatus*), ♀. Presented by the Lady Sheffield.

1 Eleonora Falcon (*Falco eleonoræ*). Deposited.

1 Rose-ringed Parrakeet (*Palæornis docilis*). Presented by Mrs. Loveday.

1 Common Chameleon (*Chamæleon vulgaris*). Presented by Mr. J. Clark.

2 Cross-bred Pigs (between *Sus andamanensis* ♂ and *S. leucomystax* ♀). Born in the Menagerie.

13. 1 Reeve's Muntjac (*Cervulus reevesii*), ♀. Born in the Menagerie.

1 Hybrid Philippine Deer (between *C. marianus* ♀ and ♂ sp.?). Born in the Menagerie.

14. 1 Wood-Owl (*Syrnium aluco*). Presented by Mr. S. O. Hincks.

1 Slow Loris (*Nycticebus tardigradus*). Purchased.

15. 2 Common Ravens (*Corvus corax*). Presented by Mr. P. W. Bennett.

2 Bronze-winged Pigeons (*Phaps chalcoptera*). Hatched in the Gardens.

1 Olive Weaverbird (*Hyphantornis capensis*). Hatched in the Gardens.

16. 2 Passerine Owls (*Glaucidium passerinum*). Presented by Mr. C. W. Tait, C.M.Z.S. From Portugal.

1 Common Hangnest (*Icterus vulgaris*). Deposited.

1 Wryneck (*Yunx torquilla*). Purchased.

3 Egyptian Geese (*Chenalopex ægyptiaca*). Hatched in the Gardens.

9 Mandarin Ducks (*Aix galericulata*). Hatched in the Gardens.

1 Moustache Monkey (*Cercopithecus cephus*). Received.

17. 1 Coati (brown var.) (*Nasua nasica*). Purchased.

1 Spotted Cavy (*Cœlogenys paca*). Purchased.

4 Cuming's Octodons (*Octodon cumingii*). Born in the Menagerie.

July 18. 4 Amherst's Pheasants (*Thaumalea amherstiæ*). Deposited.
1 Berigora Hawk (*Hieracidea berigora*). Purchased.
20. 1 Mocking-bird (*Mimus polyglottus*). Hatched in the Gardens.
1 Red-backed Buzzard (*Buteo erythronotus*). Purchased. From South America.
21. 1 Malbrouck Monkey (*Cercopithecus cynosurus*), ♂. Presented by Mr. H. A. M. De Lichtabbel.
1 Wanderoo Monkey (*Macacus silenus*), ♂. Presented by Lieut. Vipan.
1 Rose-crested Cockatoo (*Cacatua moluccensis*). Presented by Mr. J. C. Elmes.
3 Grey-headed Parrakeets (*Bolborhynchus monachus*). Presented by Mr. C. Punchard.
2 Violet Tanagers (*Euphonia violacea*). Presented by Capt. T. Jarvis.
1 Common Magpie (*Pica caudata*). Presented by Mrs. L. Grenville.
22. 6 Common Guillemots (*Uria troile*). Presented by Sir Henry Dalrymple, Bart. From the Bass Rock.
2 Masked Jay Thrushes (*Garrulax perspicillatus*). Purchased.
1 Sooty Mangaby (*Cercocebus fuliginosus*). Presented by Mrs. Martin.
23. 1 King Vulture (*Gyparchus papa*). Deposited.
24. 2 Yellow-billed Sheath-bills (*Chionis alba*). Presented by Mr. H. Roberts.
25. 2 Tigers (*Felis tigris*), ♂ and ♀. Presented by H.E. the Governor-General of India. See above, p. 494.
2 Arabian Gazelles (*Gazella arabica*), ♂ and ♀. Presented by Mrs. Benecke. From Aden. See above, p. 494.
1 Common Chameleon (*Chamæleon vulgaris*). Presented by Mr. J. P. Golding Bird.
1 Philantomba Antelope (*Cephalophus maxwelli*), ♂. Born in the Menagerie.
27. 1 Tamandua Ant-eater (*Tamandua tetradactyla*), ♀. Purchased.
3 Horned Lizards (*Phrynosoma cornutum*). Presented by Mr. F. Painter.
28. 1 Lesser Sulphur-crested Cockatoo (*Cacatua sulphurea*). Presented by Mr. A. Pearson.
29. 3 Graceful Ground-Doves (*Geopelia cuneata*). Purchased.
2 Elegant Grass-Parrakeets (*Euphema elegans*). Purchased.
3 Blotched Genets (*Genetta tigrina*). Born in the Menagerie.
31. 2 Black-handed Spider Monkeys (*Ateles melanochir*), 2 ♀. Presented by Mr. S. W. Rix.
1 Laughing Kingfisher (*Dacelo gigantea*). Presented by Mr. J. Sydney White.
1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Miss S. Hooper.
1 Blossom-headed Parrakeet (*Palæornis cyanocephalus*). Presented by George Lawson, Esq.
1 Lozenge-marked Lizard (*Amphibolurus angulifer*). Purchased.
3 White's Skinks (*Hinulia whitei*). Purchased.

Aug. 1. 1 Rhesus Monkey (*Macacus erythræus*), ♂. Presented by W. Owen Cosgrove, Esq.
2 Barbary Turtledoves (*Turtur risorius*). Presented by Miss A. French.
4. 3 Small-scaled Mastigures (*Uromastix microlepis*). Presented

by Capt. Phillips. From Busreh, Persian Gulf. See above, p. 495.
Aug. 5. 1 Black-eared Marmoset (*Hapale penicillata*), ♂. Deposited.
1 Black-fronted Lemur (*Lemur nigrifrons*?). Purchased.
2 Yellow-bellied Liothrix (*Liothrix luteus*). Received in exchange.
6. 4 Rufous Tinamous (*Rhynchotus rufescens*). Presented by Mr. Alfred O. Lumb. From the Argentine Republic.
7. 2 Egyptian Gazelles (*Gazella dorcas*), ♂ and ♀. Presented by Mr. G. Muscat.
1 Whimbrel (*Numenius phæopus*). Presented by Dr. Stafford.
8. 1 Yaguarundi Cat (*Felis yaguarundi*), ♀. Purchased.
10. 5 Common Kingfishers (*Alcedo ispida*). Purchased.
1 Bennett's Wallaby (*Halmaturus bennetti*), ♀. Born in the Menagerie.
1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Received in exchange.
11. 1 Macaque Monkey (*Macacus cynomolgus*) (white var.), ♀. Presented by Sir Andrew Clarke, K.C.M.G., &c. See above, p. 495.
1 Red-billed Toucan (*Ramphastos erythrorhynchus*). Presented by Mr. Philip Hannington.
13. 1 Common Cuckoo (*Cuculus canorus*). Presented by Dr. E. Etheridge.
1 West-African Python (*Python sebæ*). Deposited.
1 Crested Agouti (*Dasyprocta cristata*). Purchased.
14. 1 Puma (*Felis concolor*). Presented by Mr. W. D. Powles.
3 Kinkajous (*Cercoleptes caudivolvus*). Presented by Mr. W. D. Powles.
2 Cocteau's Skinks (*Macroscincus cocteaui*). Presented by Prof. Barboza du Bocage, F.M.Z.S. From Cape-Verd Islands. See above, p. 495.
17. 1 Black-eared Marmoset (*Hapale penicillata*). Deposited.
1 Purple-headed Glossy Starling (*Lamprocolius auratus*). Hatched.
18. 1 Common Snake (*Tropidonotus natrix*). Presented by Mr. T. Susini.
19. 2 Suricates (*Suricata zenik*), ♂ and ♀. Deposited.
1 Common Crowned Pigeon (*Goura coronata*). Hatched.
2 Bronze-winged Pigeons (*Phaps chalcoptera*). Hatched.
21. 2 Chukar Partridges (*Caccabis chukar*), ♂ and ♀. Presented by the Hon. Justice Jackson.
4 Sandwich Terns (*Sterna cantiaca*). Purchased.
4 Avocets (*Recurvirostra avocetta*). Purchased.
24. 2 Black-eared Marmosets (*Hapale penicillata*), ♂ and ♀. Presented by Mr. J. P. Harrison.
25. 1 One-Wattled Cassowary (*Casuarius uniappendiculatus*). Presented by Capt. Moresby, R.N. From New Guinea. See above, p. 495, also P. Z. S. 1875, plate xx.
26. 1 Vervet Monkey (*Cercopithecus lalandii*), ♂. Presented by Mr. C. Hassam.
1 Chattering Guan (*Ortalida garrula*). Presented by Mr. G. Dawson Rowley, F.Z.S.
27. 1 Javan Chevrotain (*Tragulus javanicus*), ♀ Presented by Mr. G. Manning.
28. 1 Formosan Deer (*Cervus pseudaxis*). Presented by Mr. Abel A. J. Gower.
1 Indian Python (*Python molurus*). Presented by Capt. Raison.

Aug. 28. 2 Black Swans (*Cygnus atratus*). Presented by Mr. R. H. Bower.
29. 1 Kingfisher (*Alcedo ispida*). Purchased.
1 American Kestrel (*Tinnunculus sparverius*). Purchased.
31. 1 Prairie-Marmot (*Arctomys ludovicianus*). Presented by Mr. H. Thellusson.

Sept. 1. 4 Houbara Bustards (*Houbara undulata*). Purchased. From Tripoli.
2. 1 Golden Agouti (*Dasyprocta aguti*). Received in exchange.
1 Guilding's Amazon (*Chrysotis guildingi*). Purchased. From St. Vincent.
3. 1 Toque Monkey (*Macacus pileatus*). Presented by Mrs. Thomas.
4. 1 Arctic Fox (*Canis lagopus*). Presented by Mr. Keell.
1 Black-headed Gull (*Larus ridibundus*). Presented by Mr. Keell.
5. 1 Red-backed Squirrel Monkey (*Saimaris œrstedi*). Presented by Mr. W. F. Kelly. From Guatemala. See above, p. 495.
1 Black-and-white Sparrow-Hawk (*Accipiter melanoleucus*). Presented by Capt. Griffiths. Captured at Sea, off Cape Verd.
6. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by H. C. M. Lichtabbell.
1 Malbrouck Monkey (*Cercopithecus cynosurus*), ♂. Presented by H. C. M. Lichtabbell.
8. 1 Axis Deer (*Cervus axis*), ♂. Born in the Menagerie.
1 Crested Pigeon (*Ocyphaps lophotes*). Hatched in the Gardens.
2 Graceful Ground-Doves (*Geopelia cuneata*). Hatched in the Gardens.
9. 2 Green Fruit-Pigeons (*Carpophaga sylvatica*). Received in exchange.
1 Slow-worm (*Anguis fragilis*). Presented by Mr. J. E. Ker.
10. 1 Cinereous Sea-Eagle (*Haliaëtus albicilla*). Presented by Mr. W. J. Sadler. From Norway.
4 Common Tench (*Tinca vulgaris*). Presented by Mr. W. Adlington.
11. 1 Servaline Cat (*Felis servalina*). Presented by Mr. Spencer Shield. From Kinsembo, near Ambriz, Congo, W. Africa. See above, p. 495, plate lxiii.
1 European Terrapin (*Emys europæa*). Deposited.
12. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mr. P. T. Wharton.
1 Weeper Capuchin (*Cebus capucinus*), ♂. Deposited.
2 Peregrine Falcons (*Falco peregrinus*). Presented by Mr. Herbert Wood, F.Z.S.
14. 1 Chimpanzee (*Troglodytes niger*), ♂. Presented by Mr. C. Mosse, C.M.Z.S.
1 Bay Antelope (*Cephalophus dorsalis*), ♀. Presented by Mr. C. Mosse, C.M.Z.S.
3 Royal Pythons (*Python regius*). Presented by Mr. C. Mosse, C.M.Z.S.
1 Rhesus Monkey (*Macacus erythræus*), ♀. Presented by Major E. Stainley.
1 Grey Ichneumon (*Herpestes griseus*), ♂. Presented by Capt. Hallett.
15. 1 Broad-snouted Caiman (*Jacare latirostris*). Presented by Capt. Turner. From Demerara.

Sept. 15. 2 Little Bitterns (*Ardetta minuta*), ♂ and ♀. Presented by Mr. Van Bemmelen.
1 Yellow-fronted Amazon (*Chrysotis ochrocephala*). Deposited.
16. 1 Grey Ichneumon (*Herpestes griseus*), ♀. Deposited.
1 Violaceous Night-Heron (*Nycticorax violaceus*). Purchased.
17. 1 King Vulture (*Gyparchus papa*). Presented by Mr. G. J. Brunnschweiler.
1 Green Grass-Snake (*Cyclophis vernalis*). Presented by Mr. F. Painter.
19. 2 American Thrushes (*Turdus migratorius*). Purchased.
1 Bicheno's Finch (*Estrelda bichenovii*). Purchased.
2 Modest Grass-Finches (*Amadina modesta*). Purchased.
21. 1 Praslin Parrakeet (*Coracopsis barklyi*). Presented by the Hon. Sir A. Gordon, C.M.Z.S. From Mauritius.
4 Red-crowned Pigeons (*Erythrœnas pulcherrima*). Presented by the Hon. Sir A. Gordon, C.M.Z.S.
6 Fire-tailed Finches (*Erythrura prasina*). Deposited.
4 Indian Tortoises (*Testudo indica*). Deposited by the Hon. Sir A. Gordon, C.M.Z.S. From Aldebra Island. See above, p. 496.
1 Bell Cinixys (*Cinixys belliana*). Deposited. From Mahé, Seychelles. See above, p. 496.
2 Blackish Sternotheres (*Sternotherus subniger*). Deposited. From the Seychelles. See above, p. 496.
1 Common Hedgehog (*Erinaceus europæus*). Presented by Mr. Angus.
1 American Black Snake (*Coluber guttatus*). Purchased.
22. 1 Vulpine Phalanger (*Phalangista vulpina*). Born in the Menagerie.
23. 1 Punjaub Wild Sheep (*Ovis cycloceros*), ♀. Deposited.
1 Hocheur Monkey (*Cercopithecus nictitans*), ♀. Purchased.
24. 2 Burchell's Bustards (*Eupodotis kori*). Purchased.
26. 1 White Stork (*Ciconia alba*). Deposited.
30. 1 Rhesus Monkey (*Macacus erythræus*), ♂. Deposited.
4 Little Bustards (*Tetrax campestris*). Purchased.
1 Solitary Tinamou (*Tinamus solitarius*). Received in exchange.
3 Lesser Pin-tailed Sand-Grouse (*Pterocles exustus*). Received in exchange.
2 Cornish Choughs (*Fregilus graculus*). Deposited.

Oct. 1. 2 Call-Ducks (*Anas boschas*), ♂ and ♀. Presented by Mrs. Wilson.
5. 1 Gannet (*Sula bassana*). Presented by Mr. R. R. B. Norman.
6. 1 White-backed Trumpeter (*Psophia leucoptera*). Deposited.
7. 1 Australian Rail (*Rallus pectoralis*). Presented by Mr. J. Harris.
1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mr. M. Nicholson.
8. 1 Yellow-vented Bulbul (*Pycnonotus crocorrhous*). Deposited.
9. 1 Geoffroy's Marmoset (*Midas geoffroii*). Deposited.
1 Common Jay (*Garrulus glandarius*). Presented by Master P. Fulcher.
1 Red-footed Fox (*Canis fulvipes*). Presented by Mr. F. Grant. From Pernambuco.
10. 1 Dusky Monkey (*Semnopithecus obscurus*), ♂. Purchased.
1 White-throated Capuchin (*Cebus hypoleucus*), ♂. Deposited.

Oct. 12. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by H.R.H. the Princess Beatrice.

2 Bronze-winged Pigeons (*Phaps chalcoptera*). Bred in the Gardens.

2 Vinaceous Turtledoves (*Turtur vinaceus*). Bred in the Gardens.

13. 1 Peewit (*Vanellus cristatus*). Purchased.

1 Malbrouck Monkey (*Cercopithecus cynosurus*). Deposited.

14. 2 Cinereous Sea-Eagles (*Haliaëtus albicilla*). Presented by Major Jary, F.Z.S.

2 Common Dormice (*Myoxus muscardinus*). Presented by Mr. H. P. Blackmore.

4 Azure Titmice (*Parus cyanus*). Purchased.

4 Yellow-breasted Buntings (*Euspiza aureola*). Purchased.

1 White-bellied Nuthatch (*Sitta europæa*). Purchased.

2 European Rollers (*Coracias garrula*). Purchased.

15. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mrs. Fullard.

1 Black-handed Spider Monkey (*Ateles melanochir*). Purchased.

1 Collared Peccary (*Dicotyles tajacu*). Purchased.

1 Blue-and-Yellow Macaw (*Ara ararauna*). Purchased.

1 Red-and-Yellow Macaw (*Ara chloroptera*). Purchased.

1 Naked-throated Bell-bird (*Chasmorhynchus nudicollis*). Purchased. From Bahia.

1 Solitary Tinamou (*Tinamus solitarius*). Purchased. From Rio de Janeiro.

1 Alligator (*Alligator mississippiensis*). Deposited.

1 Wood-Owl (*Syrnium aluco*). Presented by the Rev. P. R. Gorringe.

16. 1 Chacma Baboon (*Cynocephalus porcarius*), ♂. Presented by Mr. J. D. Lloyd.

1 Common Wolf (*Canis lupus*), ♀. Presented by Mr. Danford.

1 Sun-Bittern (*Eurypyga helias*). Deposited.

17. 1 Blaubok (*Cephalophus pygmæus*). Purchased.

1 Common Paradoxure (*Paradoxurus typus*). Presented by Mr. O. Unwin.

1 Quebec Marmot (*Arctomys monax*). Presented by Mr. C. Hersey.

1 Goffin's Cockatoo (*Cacatua goffini*). Presented by F. J. Dean, F.Z.S. See P. Z. S. 1875, pl. x.

1 Rose Hill-Parrakeet (*Platycercus eximius*). Presented by F. J. Dean, F.Z.S.

19. 1 Bengalese Leopard Cat (*Felis bengalensis*), ♂. Presented by Capt. W. Reynolds.

1 Common Paradoxure (*Paradoxurus typus*). Presented by Capt. W. Reynolds.

1 Great Eagle Owl (*Bubo maximus*). Presented by Lord Londesborough, F.Z.S.

1 West-India Rail (*Aramides cayennensis*). Purchased.

2 Geoffroy's Doves (*Peristera geoffroyi*). Purchased. From the island of Fernando de Noronha.

1 Common Kestrel (*Tinnunculus alaudarius*). Presented by Mr. J. Page.

20. 1 Monteiro's Galago (*Galago monteiri*). Deposited.

1 Barbel (*Barbus vulgaris*). Purchased.

21. 1 Indian Fruit-Bat (*Pteropus medius*). Presented by Dr. Stafford.

Oct. 22. 1 Gentoo Penguin (*Pygosceles tæniatus*). Purchased. See above, p. 605.
23. 1 Pinche Monkey (*Midas œdipus*). Presented by W. Stride, Esq.
1 Tooth-billed Pigeon (*Didunculus strigirostris*). Presented by J. W. Boddam Whetham, Esq. See above, p. 605.
24. 1 Short-eared Owl (*Otus brachyotus*). Presented by Mrs. Darley.
1 Common Kestrel (*Tinnunculus alaudarius*). Presented by Mr. F. Stileman.
26. 1 Bonnet-Monkey (*Macacus radiatus*), ♀. Presented by Mr. T. Hughes.
28. 2 Thicknees (*Œdicnemus crepitans*). Deposited.
29. 1 White Stork (*Ciconia alba*). Deposited.

Nov. 1. 1 Black-backed Piping Crow (*Gymnorhina leuconota*). Presented by Mr. F. Fuller.
1 Speckled Terrapin (*Clemmys guttata*). Presented by Mr. A. B. Duncan.
2. 1 Humboldt's Saki (*Pithecia monachus*). Purchased. See above, p. 664.
1 Bengalese Leopard Cat (*Felis bengalensis*). Purchased.
1 Egyptian Cat (*Felis chaus*). Purchased.
1 Crested Porcupine (*Hystrix cristata*). Purchased.
3. 1 Patas Monkey (*Cercopithecus ruber*), ♂. From Lagos, W. Africa. Presented by Dr. R. F. Mayne. See above, p. 664.
2 Weeper Capuchins (*Cebus capucinus*), ♂ and ♀. Deposited.
4. 3 Night-Parrots (*Stringops habroptilus*). Purchased. See above, p. 665.
1 Bar-headed Goose (*Anser indicus*), ♂. Purchased.
5. 1 Leadbeater's Cockatoo (*Cacatua leadbeateri*). Deposited.
2 Graceful Ground-Doves (*Geopelia cuneata*). Hatched in the Gardens.
6. 1 Indian Muntjac (*Cervulus muntjac*), ♂. Purchased. From Saigou. See above, p. 665.
9. 1 Silvery Marmoset (*Hapale argentata*), ♂. Purchased.
10. 1 Red-shouldered Starling (*Agelæus phœniceus*). Presented by Mrs. Boswell.
11. 1 Common Rhea (*Rhea americana*). Purchased.
1 Alligator (*Alligator mississippiensis*). Deposited.
13. 1 Pine-Marten (*Martes abietum*), ♂. Presented by Mr. J. Francis.
2 Aztec Conures (*Conurus aztec*). Purchased.
18 Lancelets (*Branchiostoma lanceolatum*). Presented by the Directors of the Zoological Station, Naples.
16. 1 Common Kestrel (*Tinnunculus alaudarius*). Presented by Miss M. Truefit.
17. 2 Muntjacs (*Cervulus*, sp. inc.), ♂ and ♀. Presented by Mr. W. P. Galton. From Formosa. See above, p. 665.
1 Roseate Cockatoo (*Cacatua roseicapilla*). Presented by H. J. Aveling.
18. 1 Black-eared Marmot (*Hapale penicillata*), ♀. Deposited.
19. 1 Giant Toad (*Bufo agua*). Presented by Mr. D'Arcy. From Brazil.
20. 1 Pomatorhine Skua (*Lestris pomatorhinus*). Purchased.
23. 1 Gazelle (*Gazella dorcas*), ♀. Presented by Miss Lancaster.
6 Mocking-birds (*Mimus polyglottus*). Deposited.

Nov. 24. 2 Great Kangaroos (*Macropus giganteus*), 2 males. Presented by Mr. A. Nicol.

2 Common Boas (*Boa constrictor*). Presented by Mr. N. Holland. From St. Lucia.

2 West-Indian Agoutis (*Dasyprocta antillensis*). Presented by Mr. N. Holland. From St. Lucia. See above, p. 665.

1 Wrinkled Terrapin (*Clemmys rugosa*). Purchased.

25. 2 Japanese Teal (*Querquedula formosa*), ♂ and ♀. Deposited.

1 Scarlet Ibis (*Ibis rubra*). Received in exchange.

26. 1 Orange Helictis (*Helictis subaurantiaca*). Purchased. See above, p. 666.

1 Ash-coloured Buzzard (*Urubitinga anthracina*). Purchased. From St. Vincent.

1 Black-shouldered Peafowl (*Pavo nigripennis*), ♂. Presented by the Hon. A. S. G. Canning.

27. 1 Virginian Deer (*Cervus virginianus*), ♀. Presented by Capt. E. N. Cobbett.

1 Rhesus Monkey (*Macacus erythræus*), ♂. Deposited.

1 Vervet Monkey (*Cercopithecus lalandi*), ♂. Deposited.

1 Grey Ichneumon (*Herpestes griseus*), ♂. Deposited.

28. 1 Chinese Magpie (*Pica sericea*). Purchased.

1 Black-faced Spider Monkey (*Ateles ater*), ♀. Deposited.

30. 1 Capybara (*Hydrochœrus capybara*). Born in the Menagerie.

1 Common Raccoon (*Procyon lotor*). Presented by Mr. T. Trimnell.

1 Kingfisher (*Alcedo ispida*). Purchased.

Dec. 1. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mrs. Phillips.

1 Raven (*Corvus corax*). Presented by Mr. F. Lubbock.

2. 1 Solitary Tinamou (*Tinamus solitarius*). Received in exchange.

1 Raven (*Corvus corax*). Presented by Mr. J. Salmon.

3. 3 Black-footed Penguins (*Spheniscus demersus*). Purchased.

4. 2 Glaucous Gulls (*Larus glaucus*). Presented by Mr. R. E. Beaumont. From Spitzbergen.

5. 1 Raven (*Corvus corax*). Presented by Colonel Burrughs.

11. 1 Chamois (*Rupicapra tragus*), ♀. Presented by Mr. A. Wilson. From the Pyrenees.

2 Barred-tailed Pheasants (*Phasianus reevesii*), ♂ and ♀. Received in exchange.

12. 1 White-fronted Capuchin (*Cebus albifrons*), ♀. Deposited.

1 Common Boa (*Boa constrictor*). Presented by Capt. E. C. Kemp.

15. 1 Campbell's Monkey (*Cercopithecus campbelli*). Purchased. See P. Z. S. 1875, p. 1.

18. 1 Peregrine Falcon (*Falco peregrinus*). Presented by Mr. A. F. Ross.

21. 1 Bonnet-Monkey (*Macacus radiatus*), ♀. Presented by Mr. L. Miller.

23. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Miss J. Watt.

2 Pampas Deer (*Cervus campestris*), ♂ and ♀. From the Argentine Republic. Purchased. See P. Z. S. 1875, p. 1.

2 Hardwicke's Mastigures (*Uromastix hardwickii*). Presented by Lieut. Col. C. S. Sturt. See P. Z. S. 1875, p. 1.

1 Nicobar Pigeon (*Calœnas nicobarica*). Presented by Capt. R. J. Wimberley.

Dec. 24. 2 Plantain-Squirrels (*Sciurus plantani*). Presented by Mr. H. A. M. de Lichtabbel. From Singapore.
1 Paradise Whydah bird (*Vidua paradisea*). Received in exchange.
1 Pintailed Whydah bird (*Vidua principalis*). Received in exchange.
28. 5 Silky Bower-birds (*Ptilonorhynchus violaceus*). Purchased.
31. 1 Collared Peccary (*Dicotyles tajacu*). Purchased.
1 Spotted Cavy (*Cœlogenys paca*). Purchased.
2 Guans (*Ortalida*, sp. inc.). Purchased.
1 Sharp-nosed Crocodile (*Crocodilus americanus*). Purchased.

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